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

SUBJECT: **NOTICE OF COMPLETION OF A DRAFT PROGRAM ENVIRONMENTAL ASSESSMENT**

PROJECT TITLE: **PROPOSED AMENDED REGULATION XX - REGIONAL CLEAN AIR INCENTIVES MARKET (RECLAIM)**

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and has prepared a Draft Program Environmental Assessment (PEA) to analyze environmental impacts from the project identified above pursuant to its certified regulatory program (SCAQMD Rule 110). The Draft PEA includes a project description and analysis of potential adverse environmental impacts that could be generated from the proposed project. The purpose of this letter, the attached Notice of Completion (NOC), and the Draft PEA, is to allow public agencies and the public the opportunity to review and comment on the environmental analysis.

This letter, the attached NOC, and the Draft PEA are not SCAQMD applications or forms requiring a response from you. Their purpose is simply to provide information to you on the above project. If the proposed project has no bearing on you or your organization, no action on your part is necessary. The Draft PEA and other relevant documents may be obtained by calling the SCAQMD Public Information Center at (909) 396-2039 or accessing the SCAQMD's CEQA website at http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/scaqmd-projects---year-2015.

Comments relative to the Draft PEA focusing on your area of expertise, your agency's area of jurisdiction, if applicable, or issues relative to the environmental analysis should be addressed to Ms. Barbara Radlein (c/o CEQA) at the address shown above, or sent by fax to (909) 396-3324 or by email to bradlein@aqmd.gov. Comments must be received no later than 5:00 p.m. on Tuesday, September 29, 2015. Please include the name and phone number of the contact person. Questions relative to the proposed amended regulation for the refinery sector should be directed to Ms. Minh Pham at (909) 396-2613 or by email to mpham@aqmd.gov. Questions relative to the proposed amended regulation for the non-refinery sector should be directed to Mr. Kevin Orellana at (909) 396-3492 or by email to korellana@aqmd.gov.

The Public Hearing for the proposed amended regulation is scheduled for November 6, 2015. (Note: Public meeting dates are subject to change).

Date: August 13, 2015 **Signature:** Barbara Radlein

Barbara Radlein
Program Supervisor, CEQA Special Projects
Planning, Rules, and Area Sources

Reference: California Code of Regulations, Title 14, §§15085, 15087, and 15372

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765-4182

NOTICE OF COMPLETION OF A DRAFT PROGRAM ENVIRONMENTAL ASSESSMENT

Project Title:
Draft Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

Project Location: The proposed project may affect NOx RECLAIM facilities located throughout the South Coast Air Quality Management District's (SCAQMD) jurisdiction, which covers all of Orange County, the urban portions of Los Angeles and San Bernardino counties southwest of the San Bernardino and San Gabriel mountains, and nearly all of Riverside County, with the exception of communities near the state border.

Description of Nature, Purpose, and Beneficiaries of Project: To comply with the requirements in Health and Safety Code §§40440 and 39616 by conducting a Best Available Retrofit Control Technology (BARCT) assessment, SCAQMD staff is proposing amendments to the following rules which are part of Regulation XX: Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx); Rule 2005 – New Source Review For RECLAIM; Attachment C from Rule 2011 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Sulfur (SOx) Emissions; and, Attachment C from Rule 2012 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Nitrogen (NOx) Emissions. The proposed amendments to Regulation XX would reduce emissions from equipment and processes operated at NOx RECLAIM facilities located throughout the entire SCAQMD jurisdiction. In particular, the environment could be impacted from the proposed project due to facilities installing new, or modifying existing control equipment for the following types of equipment/source categories in the NOx RECLAIM program: 1) fluid catalytic cracking units; 2) refinery boilers and heaters; 3) refinery gas turbines; 4) sulfur recovery units – tail gas treatment units; 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant internal combustion engines; 8) container glass melting furnaces; 9) coke calcining; and, 10) metal heat treating furnaces. For clarity and consistency throughout the regulation, other minor revisions are also proposed. The Initial Study identified the following environmental topics as areas that may be adversely affected by the proposed project: aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic. Further analysis of these environmental areas in the Draft Program Environmental Assessment (PEA) has shown that only the topics of air quality and GHGs, hydrology (water demand), and, hazards and hazardous materials (due to ammonia transportation) exceed the SCAQMD's significance thresholds associated with implementing the proposed project.

Lead Agency:	**Division:**
South Coast Air Quality Management District	Planning, Rule Development and Area Sources

Draft PEA and all supporting documentation are available at:	**or by calling:**	**The Draft PEA can also be obtained by accessing the SCAQMD's website at:**
SCAQMD Headquarters 21865 Copley Drive Diamond Bar, CA 91765	(909) 396-2039	http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/scaqmd-projects---year-2015

The Notice of Completion is provided to the public through the following:

☑ Los Angeles Times (August 14, 2015)
☑ SCAQMD Public Information Center
☑ SCAQMD Mailing List & Interested Parties
☑ SCAQMD Website

Draft PEA Review Period (46 days): August 14, 2015 – September 29, 2015

Scheduled Public Meeting Date(s) (subject to change):
SCAQMD Governing Board Hearing: November 6, 2015, 9:00 a.m.; SCAQMD Headquarters

The proposed project may have statewide, regional or areawide significance, therefore, a scoping meeting was required (pursuant to Public Resources Code §21083.9 (a)(2)) and held at SCAQMD Headquarters on January 8, 2015.

	Phone:	**Email:**	**Fax:**
Send CEQA Comments to: Ms. Barbara Radlein	(909) 396-2716	bradlein@aqmd.gov	(909) 396-3324
Direct Questions on Proposed Amended Regulation XX for Refinery Sector: Ms. Minh Pham	(909) 396-2613	mpham@aqmd.gov	(909) 396-3324
Direct Questions on Proposed Amended Regulation XX for Non-Refinery Sector: Mr. Kevin Orellana	(909) 396-3492	korellana@aqmd.gov	(909) 396-3324

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

August 2015

SCAQMD No. 12052014BAR
State Clearinghouse No: 2014121018

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

PREFACE

This document constitutes the Draft Program Environmental Assessment (PEA) for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM). A Notice of Preparation/Initial Study (NOP/IS) was released for a 57-day public review and comment period from December 5, 2014 to January 30, 2015 which identified the environmental topics of aesthetics; air quality and greenhouse gas emissions; energy; hydrology and water quality; hazards and hazardous materials; solid and hazardous waste; and, transportation and traffic, as potentially being significantly adversely affected by the project. Eight comment letters were received from the public regarding the preliminary analysis in the NOP/IS. These comment letters and responses to individual comments are included in Appendix G of this document.

TABLE OF CONTENTS

Page No.

Chapter 4 – Environmental Impacts

Page No.

Page No.

Page No.

LIST OF TABLES

Page No.

LIST OF TABLES (continued)

Page No.

LIST OF TABLES (continued)

Page No.

LIST OF TABLES (continued)

Page No.

LIST OF TABLES (concluded)

Page No.

LIST OF FIGURES

CHAPTER 1

EXECUTIVE SUMMARY

1.0 INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and 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. By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all federal and state ambient air quality standards for the District[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[3]. The Final 2012 AQMP concluded that reductions in emissions of particulate matter (PM), oxides of sulfur (SOx), oxides of nitrogen (NOx), and volatile organic compounds (VOC) are necessary to attain the state and national ambient air quality standards for ozone, and particulate matter with an aerodynamic diameter of 2.5 microns or less (PM2.5). Ozone, a criteria pollutant which has been shown to adversely affect human health, is formed when VOCs react with NOx in the atmosphere. VOCs, NOx, SOx (especially sulfur dioxide) and ammonia also contribute to the formation of PM10 and PM2.5.

The Basin is designated by the United States Environmental Protection Agency (EPA) as a non-attainment area for PM2.5 emissions because the federal PM2.5 standards have been exceeded. For this reason, the SCAQMD is required to evaluate all feasible control measures in order to reduce direct PM2.5 emissions, as well as PM2.5 precursors, such as NOx and SOx. The Final 2012 AQMP sets forth a comprehensive program for the Basin to comply with the federal 24-hour PM2.5 air quality standard, satisfy the planning requirements of the federal Clean Air Act, and provide an update to the Basin's commitments towards meeting the federal 8-hour ozone standard. In particular, the Final 2012 AQMP contains a multi-pollutant control strategy to achieve attainment with the federal 24-hour PM2.5 air quality standard with direct PM2.5 and NOx reductions identified as the two most effective tools in reaching attainment with the PM2.5 standard. The 2012 AQMP also serves to satisfy the recent requirements promulgated by the EPA for a new attainment demonstration of the revoked 1-hour ozone standard, as well as to provide additional measures to partially fulfill long-term reduction obligations under the 2007 8-hour Ozone State Implementation Plan (SIP).

As part of this ongoing PM2.5 reduction effort, SCAQMD staff is proposing amendments to Regulation XX – Regional Clean Air Incentives Market (RECLAIM) to achieve additional NOx emission reductions to address best available retrofit control technology (BARCT) requirements and to modify the RECLAIM trading credit (RTC) "shaving" methodology. The primary focus of the proposed project is to bring the NOx RECLAIM program up-to-date with the latest BARCT requirements while achieving the proposed NOx emission reductions in the 2012 AQMP Control Measure #CMB-01: Further NOx Reductions from RECLAIM (e.g., at least three to five tons per day by 2023). In addition, the proposed project is designed to implement both the Phase I and Phase II reduction commitments described in #CMB-01.

Control measure CMB-01 included an initial estimate of two to three tons per day of NOx emission reductions. However, further analysis of the actual BARCT NOx emission control opportunities for the various equipment/process categories demonstrated that the proposed project could achieve 14 tons per day of NOx emission reductions by 2023 which is much higher

[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health and Safety Code, §§40400-40540).
[2] Health and Safety Code, §40460 (a).
[3] Health and Safety Code, §40440 (a).

than estimates provided in the 2012 AQMP. Higher NOx emission reductions will further assist in attaining the national ambient air quality standards evaluated in the 2012 AQMP.

The proposed project will apply to the following types of equipment/source categories in the NOx RECLAIM program: 1) fluid catalytic cracking units (FCCUs); 2) refinery boilers and heaters; 3) refinery gas turbines; 4) sulfur recovery units – tail gas treatment units (SRU/TGUs); 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant internal combustion engines (ICEs); 8) container glass melting furnaces; 9) coke calcining; 10) Portland cement kilns; and, 11) metal heat treating furnaces. Additional amendments are proposed to establish procedures and criteria for reducing NOx RECLAIM RTCs and NOx RTC adjustment factors for year 2016 and later. Other minor changes are proposed for clarity and consistency throughout the proposed amended regulation.

The overall NOx emission reductions of 14 tons per day are expected to be achieved incrementally from 2016 to 2022. In particular, the proposed project is estimated to reduce RTCs by four tons per day of NOx emissions or more starting in 2016 and continuing with an additional reduction of two tons per day of NOx for years 2018 through 2022. Despite this projected direct environmental benefit to air quality, the Notice of Preparation (NOP) and Initial Study (IS), prepared pursuant to the California Environmental Quality Act (CEQA), identified the following environmental topics as areas that may be adversely affected by the proposed project: aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic. This Draft Program Environmental Assessment (PEA) has been prepared to analyze further whether the potential impacts to these environmental topics are significant.

1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), California Public Resources Code §21000 *et seq.*, requires environmental impacts of proposed projects to be evaluated and feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects to 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 §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[4] §15051 (b)).

CEQA requires that all potential adverse environmental impacts of proposed projects be evaluated and that methods to reduce or avoid identified significant adverse environmental impacts of these projects be implemented if feasible. The purpose of the CEQA process is to inform the lead agency, responsible agencies, decision makers and the general public of potential adverse environmental impacts that could result from implementing the proposed project and to identify feasible mitigation measures or alternatives, when an impact is significant.

Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The SCAQMD's regulatory program was certified by the Secretary of Resources Agency on March 1, 1989, and has been adopted as

[4] The CEQA Guidelines are codified at Title 14 California Code of Regulations, §15000 et seq.

SCAQMD Rule 110 – Rule Adoption Procedures to Assure Protection and Enhancement of the Environment.

CEQA includes provisions for the preparation of program CEQA documents in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, including adoptions of broad policy programs as distinguished from those prepared for specific types of projects such as land use projects, for example (CEQA Guidelines §15168). A program CEQA document also allows consideration of broad policy alternatives and program-wide mitigation measures at a time when an agency has greater flexibility to deal with basic problems of cumulative impacts (CEQA Guidelines §15168 (b)(4)). Lastly, a program CEQA document also plays an important role in establishing a structure within which CEQA review of future related actions can effectively be conducted. This concept of covering broad policies in a program CEQA document and incorporating the information contained therein by reference into subsequent CEQA documents for specific projects is known as "tiering" (CEQA Guidelines §15152).

A program CEQA document, by design, provides the basis for future environmental analyses and will allow future project-specific CEQA documents, if necessary, to focus solely on the new effects or detailed environmental issues not previously considered. If an agency finds that no new effects could occur, or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program CEQA document and no new environmental document would be required (CEQA Guidelines §15168 (c)(2)).

The proposed amendments to Regulation XX are considered a "project" as defined by CEQA. The proposed project will reduce NOx emission and will provide an overall environmental benefit to air quality. However, SCAQMD's review of the proposed amendments also shows that implementation of the proposed project may also have a significant adverse effect on the environment.

In addition, because the proposed amendments to Regulation XX and their subsequent implementation: 1) are connected to the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program (CEQA Guidelines §15168 (a)(3)); and, 2) contain a series of actions that can be characterized as one large project and the series of actions are related as individual activities that would be carried out under the same authorizing regulatory authority and having similar environmental effects which can be mitigated in similar ways (CEQA Guidelines §15168 (a)(4)), the type of CEQA document appropriate for the proposed project is a Program Environmental Assessment (PEA). The PEA is a substitute CEQA document, prepared in lieu of a program environmental impact report (EIR) (CEQA Guidelines §15252), pursuant to the SCAQMD's Certified Regulatory Program (CEQA Guidelines §15251 (l); codified in SCAQMD Rule 110). The PEA is also a public disclosure document intended to: 1) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental impacts of the proposed project; and, 2) be used as a tool by decision makers to facilitate decision making on the proposed project.

The first step of preparing a Draft PEA is to prepare a Notice of Preparation (NOP) with an Initial Study (IS) that includes an Environmental Checklist and project description. The Environmental Checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. The NOP/IS is also intended to provide information about the proposed project to other public agencies and interested parties prior to the release of the Draft PEA.

On December 5, 2014, the SCAQMD, as Lead Agency for the proposed project, released a NOP/IS for the proposed project for a 57-day public review and comment period which ended on January 30, 2015. Since the proposed project may have statewide, regional or areawide significance, a CEQA scoping meeting is required and was held for the proposed project pursuant to Public Resources Code §21083.9 (a)(2) on January 8, 2014. The evaluation in the NOP/IS identified the topics of aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic, as potentially being adversely affected by the proposed project.

During the NOP/IS public comment period, the SCAQMD received eight comment letters relative to the CEQA analysis. These letters and their responses can be found in Appendix G of this document. In addition, Appendix H of this Draft PEA summarizes the comments received at the CEQA Scoping Meeting held on January 8, 2015 and the responses to the comments.

In accordance with CEQA Guidelines §15064 and §15168, SCAQMD has prepared this Draft PEA to evaluate the potentially significant adverse impact topics that were identified in the NOP/IS (e.g., aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic) for the proposed project. This Draft PEA further analyzes whether or not the potential adverse impacts to these environmental topic areas are significant. The Draft PEA concluded that only the topics of air quality and GHGs, hydrology (water demand), and, hazards and hazardous materials (due to ammonia transportation) would have significant adverse impacts.

Any comments received during the public comment period on the analysis presented in this Draft PEA will be responded to and included in the Final PEA. Prior to making a decision on the adoption of the proposed amendments to Regulation XX, the SCAQMD Governing Board must review and certify the Final PEA as providing adequate information on the potential adverse environmental impacts that may occur as a result of adopting the proposed amendments to Regulation XX.

1.2 PREVIOUS CEQA DOCUMENTATION FOR REGULATION XX

This Draft PEA is a comprehensive environmental document that analyzes potential environmental impacts from the proposed amendments to Regulation XX. SCAQMD rules, as ongoing regulatory programs, have the potential to be revised over time due to a variety of factors (e.g., regulatory decisions by other agencies, new data, and lack of progress in advancing the effectiveness of control technologies to comply with requirements in technology forcing rules, etc.). Several previous environmental analyses have been prepared to analyze past amendments to the rules that comprise Regulation XX. The following paragraphs summarize these previously prepared CEQA documents and are included for informational purposes only. The current Draft PEA focuses on the currently proposed amendments to Regulation XX and does not rely on these previously prepared CEQA documents. The following documents can be obtained by submitting a Public Records Act request to the SCAQMD's Public Records Unit. In addition, a link for downloading files from the SCAQMD's website is provided for those CEQA documents prepared after January 1, 2000. The following is a summary of the contents of these documents, in reverse chronological order.

Notice of Exemption From CEQA for Proposed Amended Rule 2005 – New Source Review For RECLAIM; June 2011: The amendments to Rule 2005 – New Source Review For RECLAIM, changed the RECLAIM Trading Credit (RTC) hold requirement for an existing RECLAIM facility, provided its emission level stays below the level of its starting Allocations plus non-tradable credits. The amendment requires an existing RECLAIM facility to hold adequate RTCs for the first year of operation prior to commencement of operation of a new or modified source, but does not require the facility to hold RTCs at the commencement of subsequent compliance years, provided that the facility emission level remains below its starting Allocations plus non-tradable credits. The offset requirements for new RECLAIM facilities remained unchanged. The SCAQMD concluded that the amendments to Rule 2005 would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. In addition, the SCAQMD concluded that the amendments were categorically exempt because they were considered actions to protect or enhance the environment pursuant to CEQA Guidelines §15308 – Action by Regulatory Agencies for the Protection of the Environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/notices/notices-of-exemption/2011/2005noegeneral.pdf?sfvrsn=2

Final Program Environmental Assessment (PEA) for proposed amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); November 2010 (SCAQMD Number 06182009BAR / SCH Number 2009061088): A Draft PEA was prepared for amendments to Regulation XX – Regional Clean Air Incentives Market (RECLAIM), Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), were adopted to would reduce the allowable SOx emission limits based on current Best Available Retrofit Control Technology (BARCT) for the following industrial equipment and processes: 1) petroleum coke calciners; 2) cement kilns; 3) coal-fired boiler (cogeneration); 4) container glass melting furnace; 5) diesel combustion; 6) fluid catalytic cracking units; 7) refinery boilers/heaters; 8) sulfur recovery units/tail gas treatment units; and, 9) sulfuric acid manufacturing. Additional amendments were made that established procedures and criteria for reducing RECLAIM Trading Credits (RTCs) and RTC adjustment factors for year 2013 and later. The Draft PEA was released for a 45-day public review period from August 18, 2010 to October 1, 2010. The Draft PEA identified the topics of air quality and hydrology (water demand) as the only areas that may be significantly adversely affected by the project. After circulation of the Draft PEA, a Final PEA was prepared and certified by the SCAQMD Governing Board on November 5, 2010. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2010/final-program-environmental-assessment-for-proposed-amended-regulation-xx.pdf?sfvrsn=4

Notice of Exemption From CEQA for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); April 2007: The amendments to Regulation XX – RECLAIM were administrative in nature and focused on the following rules: Rule 2004 – Requirements; Rule 2007 – Trading Requirements; and Rule 2010 – Administrative Remedies and Sanctions. The amendments to Rule 2004 provided an exemption from submitting Quarterly Certification Emission Reports for facilities that do not have any NOx or SOx emitting equipment located on site. The amendments to Rule 2007 clarified the trading requirements for foreign entities that are not residing or licensed to conduct business in California, and clarified reporting requirements for parties entering into a forward contract or a contingent right contract. Amendments to Rule 2010 specified liability for allocation violations when changes of ownership occur. Other minor administrative changes were included that improved the clarity of these rules. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/notices/notices-of-exemption/2007/noe-proposed-amended-regulation-xx-rules-2004-2007-2010.pdf?sfvrsn=2

Notice of Exemption From CEQA for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); May 2005: The amendments to Regulation XX – RECLAIM were administrative in nature and focused on the following rules and protocols: Rule 2000 – General; Rule 2001 – Applicability; Rule 2005 – New Source Review for RECLAIM; Rule 2007 – Trading Requirements; Protocol for Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions; and Protocol for Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions. Amendments to Rule 2000 and Protocols for Rules 2011 and 2012 were proposed for consistency with the new source requirements for non-RECLAIM sources and for clarification that mobile source emissions are part of the total RECLAIM pollutants emitted from a facility. Amendments to Rule 2005 clarified that emissions from affected sources shall include mobile source emissions and to include an alternative quarterly holding period for RTCs for offsetting emissions from a new source. Amendments to Rule 2007 reinstated the trading provision that would allow power producers to transfer NOx RECLAIM Trading Credits among facilities under common ownership which was inadvertently omitted during the January 7, 2005 amendments to Rule 2007. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the proposed project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/home/library/public-information/noe-archive/noe---year-2005

Final Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); December 2004 (SCAQMD No. 031104BAR): A Draft Environmental Assessment (EA) for amendments to Regulation XX (Rule 2001 – Applicability; Rule 2002 – Allocations for NOx and SOx; Rule 2007 – Trading Requirements; Rule 2009 – Compliance Plans for Power Producing Facilities; Rule 2010 – Administrative Remedies and Sanctions; Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions; and, Appendix A – Protocol for SOx; and, Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; and, Appendix A – Protocol for NOx) was released for a 45-day public review period from October 22, 2004 to December 7, 2004. The amendments implemented control measure CMB-10 in the 2003 AQMP and addressed BARCT requirements to achieve additional NOx emission reductions. The Draft EA identified the topic of air quality as the only area that may be significantly adversely affected by the project. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on January 7, 2005. This document can be obtained by visiting the following website at: http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/aqmd-projects---year-2005

Notice of Exemption From CEQA for Proposed Amended Rule 2007 – Trading Requirements; September 2004: The purpose of the amendments to Rule 2007 was to address CARB concerns regarding the reintroduction of power plants to the RECLAIM trading market. The proposal contained a provision that delayed the date when the trading restrictions would be lifted until such time that other RECLAIM rule amendments (scheduled for January 2005) were adopted that would decrease allocations to implement the 2003 AQMP Control Measure CMB-10 and to reflect BARCT in accordance with Health and Safety Code (HSC) §40440. The air quality objective was to ensure that BARCT adjustments are made to facility allocations prior to removal of power plant trading restrictions. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/home/library/public-information/noe-archive/noe---year-2004

Notice of Exemption From CEQA for Proposed Amended Rule 2015 – Backstop Provisions; June 2004: The purpose of the amendments to Rule 2015 was to address the USEPA's conditional approval of Regulation XX – RECLAIM, as amended May 11, 2001. The USEPA determined that the accounting procedures for and mitigations of excess emissions that occur during a breakdown in the current version of the RECLAIM program needed to be modified because these provisions conflict with USEPA's 1999 'Excess Emissions Policy' and §110 and Part D of the federal Clean Air Act (CAA). Specifically, the amendments to Rule 2015: 1) required the SCAQMD to monitor excess emissions occurring during breakdowns that are not covered by facility RTCs, and to compare that amount to the quantity of available, unused RTCs each year for the entire RECLAIM program; and, 2) required offsets for excess unmitigated breakdown emissions. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/home/library/public-information/noe-archive/noe---year-2004

Addendum to May 2001 Final Environmental Assessment for Proposed Amended Rule 2007 – Trading Requirements; Proposed Amended Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions; and, Proposed Amended Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; October 14, 2003 (SCAQMD No. 101403BAR): The amendments to Rule 2007 required the power producers to re-enter the RECLAIM trading market. Specifically, the power producing facilities were brought back into the RECLAIM trading market and allowed to use RTCs to reconcile emissions, and to sell or transfer RTCs below the original allocation after compliance year 2003. The amendments to Rules 2011 and 2012 clarified that the 90-day recertification period for Continuous Emission Monitoring Systems (CEMS) applies when a new CEMS or a component of an existing CEMS is added to an existing or modified major RECLAIM source. An Addendum to the May 2001 Final EA for the amendments to Regulation XX (Rules 2007, 2011, and 2012) was prepared. The SCAQMD determined that an Addendum to the May 2001 Final EA was the appropriate document to prepare because none of the conditions described in CEQA Guidelines §15162 were triggered since the amendments did not contain new information of substantial importance and would not create any new significant adverse impacts or substantially increase the severity of the previously identified significant environmental effects in the original project. Further, the SCAQMD concluded that the amendments would not change the environmental analysis or conclusions in the previously certified May 2001 Final EA. Pursuant to CEQA Guidelines §15164 (c), it was not necessary to circulate the Addendum for public review. The Addendum to the May 2001 Final EA was certified by the SCAQMD Governing Board on December 5, 2003. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/aqmd-projects---year-2003

Final Environmental Assessment for Proposed New and Amended Rules, Regulation XX – RECLAIM; Rule 1631 – Pilot Credit Generation Program for Marine Vessels; Rule 1632 – Pilot Credit Generation Program for Hotelling Operations; Rule 1633 – Pilot Credit Generation Program for Truck/Trailer Refrigeration Units; and Rule 2507 – Pilot Credit Generation Program for Agricultural Pumps; May 2001 (SCAQMD No. 010201JDN): An integrated group of new and amended rules were adopted to help ensure compliance with emission allocations contemplated during initial RECLAIM program design while reducing impacts of California's electricity crisis on the RECLAIM market. The project included proposed new and amended RECLAIM rules and four voluntary mobile and area source NOx pilot credit generation rules. The project components were designed to work together to lower and stabilize RTC prices by increasing supply, reducing demand, and increasing RTC trading information availability and accuracy. A Draft EA for the amendments to Regulation XX plus proposed Rules 1631, 1632, 1633 and 2507 (which established pilot NOx credit generation rules as a means of creating additional NOx RTCs) was released for a 30-day public review period from March 27, 2001 to April 25, 2001. The analysis showed that there were potential adverse environmental effects that may result from implementing the amendments (primarily removing power producers from the trading market). The Draft EA identified "air quality" and "hazards and hazardous materials" as the only areas that may be significantly adversely affected by the project. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on May 11, 2001. This document can be obtained by visiting the following website at: http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/aqmd-projects---year-2001/fea-for-proposed-new-and-amended-regulation-xx

Final Environmental Assessment for Proposed Amended Rules 1303 – Requirements, 2005 – New Source Review for RECLAIM, 1302 - Definitions and 1309.1 - Priority Reserve; April 9, 2001 (SCAQMD No. 021401MK): The amendments to Rules 1303 and 2005 revised the modeling standard for sources locating in an attainment sub-region of the district so that any proposed new emissions plus the measured background could not create a violation of any applicable ambient air quality standard. In sub-regions designated as nonattainment areas for specified criteria pollutants, the modeling criteria remained the same, but emissions from new or modified sources were not allowed to exceed the allowable change in concentration thresholds as set forth in Rule 1303, Table A-2. The amendments to Rule 1309.1 allowed temporary access to the SCAQMD's Priority Reserve PM10 account for new electric generating facilities (EGF) for applications deemed complete between 2001 and 2003, provided that all the other requirements were met and the appropriate mitigation fee was paid. The Draft EA was released for a 30-day public review and comment period from February 14, 2001 to March 15, 2001. The Draft EA concluded that the project would not have any significant or potentially significant effects on the environment. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on April 20, 2001. This document can be obtained by visiting the following website at: http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/aqmd-projects---year-2001

Notice of Exemption From CEQA for Proposed Amended Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions; and, Proposed Amended Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NOx) Emissions; March 2001: Because the substantive components of the project involved the addition of an alternative recordkeeping option, the SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/home/library/public-information/noe-archive/noe---year-2001

Final Environmental Assessment for Proposed Amended Rules 1302 – Definitions, 1303 – Requirements, 1306 – Emissions Calculations, 2000 – General; and BACT Guidelines; August 23, 2000 (SCAQMD No. 33100JDN): The amendments bifurcated the New Source Review (NSR) control technology requirements into Lowest Achievable Emission Rate (LAER) for federal major polluting facilities and Minor Source Best Available Control Technology (MSBACT) for all others. Unlike federal LAER, state law allows the cost of the control equipment to be taken into consideration when making a BACT determination. All major polluting facilities, as defined in the federal CAA, would continue to be required to employ LAER for a new or relocated source and any emission increase from a modified source. All other facilities would be required to employ MSBACT. The amendments applied to both RECLAIM and non-RECLAIM sources. Additionally, the amendments allowed relocations of non-major polluting facilities that meet certain conditions, including no emission increases upon relocation and for two years thereafter, to maintain the existing control level from the prior location instead of requiring the installation of new BACT controls. The Draft EA was released for a 30-day public review and comment period from July 11, 2000 to August 9, 2000. The Draft EA concluded that the project would not have any significant or potentially significant effects on the environment. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on October 20, 2000. This document can be obtained by visiting the following website at: http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects/aqmd-projects---year-2000

Notice of Exemption for Proposed Amended Rule 2005 - New Source Review for RECLAIM, Rule 2011 - Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions, and Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; April 1999: The amendments included clarifications to New Source Review requirements for change of operator and modifications to new facilities. For major sources, the amendments clarified monitoring requirements and added calculation methods for cases currently not addressed. For large sources, the amendments added monitoring and calculations methods for cases currently not addressed and clarified source testing requirements. For process units, the amendments established concentration limits for determining emissions and added guidelines for category specific emission rates. The amendments also corrected rule references, extended deadlines for monthly emissions reporting, and added clarifying language to enhance enforcement and consistency. The amendments were necessary to clarify rule requirements and improve enforceability. The amendments also increased flexibility for RECLAIM facilities. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared.

Notice of Exemption for Proposed Amended Rule 2000 - General, Rule 2011 - Requirements for Monitoring, Reporting and Recordkeeping for SOx Emissions and Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; April 1997: The amendments clarified the rule requirements for emissions from contractors' equipment at RECLAIM facilities by: 1) adding a definition for contractor; 2) specifying that emissions from contractors' equipment should be accounted for by the RECLAIM facility in the same manner as emissions from rental equipment, with the exception of specific processes that do not contribute to a facility's manufacturing process; and, 3) excluding emissions from certain contractors' equipment at a Super Compliant facility. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared.

Notice of Exemption for Proposed Amended Rule 2000 - General, Rule 2001 - Applicability, Rule 2002 - Allocations for NOx and SOx, Rule 2005 - New Source Review for RECLAIM, Rule 2011 - Requirements for Monitoring, Reporting and Recordkeeping for SOx Emissions, Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions and Rule 2015 - Backstop Provisions; February 1997: The amendments modified requirements for non-operating and infrequently-operated major sources, exemption provisions, emission factors, and certain monitoring, reporting, and recordkeeping (MRR) requirements. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared.

Final Supplemental Environmental Assessment for Proposed Amended Rule 2002 - Allocations for NOx and SOx, Rule 2004 - Requirements, Rule 2005 - New Source Review for RECLAIM, Rule 2011 - Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions, Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions, and Rule 2015 - Backstop Provisions; June 1996: The amendments clarified rule requirements and improved monitoring, reporting, and recordkeeping flexibility for RECLAIM facilities. The amendments provided: 1) procedures consistent with Rule 430 - Breakdown Provisions; 2) procedures for reporting equipment breakdowns affecting RECLAIM pollutants; 3) more accurate emission factors; 4) clarifications of RTC allocations after year 2010; 5) consolidated requirements for reports on RECLAIM issues; 6) clarified requirements for Super Compliance facilities; 7) a period of time for CEMS repairs; 8) clarifications of monitoring, reporting, recordkeeping, and other requirements; and, 9) an alternative to the NOx ending emission factor for cement kilns based on a demonstration plan. Pursuant to CEQA, the SCAQMD prepared a Draft Supplemental Environmental Assessment (SEA) for the amendments to Regulation XX - RECLAIM. The Draft SEA was a supplement to the October 1993 Final EA for Regulation XX (SCAQMD No. 930524SS) and was circulated for a 45-day public review and comment period that ended May 10, 1996. The Final SEA was certified by the SCAQMD Governing Board on July 12, 1996.

Notice of Exemption for Proposed Amended Rule 1303 - Requirements (New Source Review) and Rule 2005 - New Source Review for RECLAIM; May 1996: The amendments incorporated protection of visibility for Federal Class I areas into Regulations XIII and XX. Protection of visibility for Federal Class I areas and notification of Federal Land Managers are requirements of federal law. The SCAQMD determined that the amendments were exempt from CEQA pursuant to CEQA Guidelines §15308 - Action by Regulatory Agencies for the Protection of the Environment, since the activity was covered by this Class 8 exemption for actions to assure the maintenance, restoration, enhancement, or protection of the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared.

Final Supplemental Environmental Assessment for Proposed Amended Regulation XX – RECLAIM; December 1995: The Final Supplemental EA for Regulation XX addressed the potential air quality, energy and risk of upset impacts associated with the exemption of two facilities from the RECLAIM program, State Implementation Plan (SIP) approvability issues and the allocation revision for one facility participating in the program. Air quality was the only environmental area determined to be adversely impacted from the amendments. The air quality impacts resulted from removing two facilities from the RECLAIM program and the loss of anticipated NOx emission reductions from the allocation revisions. A Statement of Findings and Overriding Considerations were prepared for the project.

Notice of Exemption for Proposed Amended Rule 2011 - Requirements for Monitoring, Reporting and Recordkeeping for SOx Emissions, and Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; September 1995: The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061 (b)(3)

- Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared.

Final Supplemental Environmental Assessment for Proposed Amended Rule 2002 - Allocations for NOx and SOx; March 1995: The Final EA for Rule 2002 addressed the potential air quality and energy impacts from adjusting the years 2000 and 2003 Allocations for the petroleum coke calcining industry. Air quality was the only area determined to be adversely impacted from the amendments due to the loss of future emission reductions. A Statement of Finding and Overriding Considerations was prepared for the amendments.

Final Environmental Assessment for the Proposed Adoption of Regulation XX - RECLAIM; October 1993: A Draft EA for the proposed NOx and SOx RECLAIM program, comprised of three volumes: Volume I - Development Report and Proposed Rules, Volume II - Supporting Documentation and Volume III - Socioeconomic and Environmental Assessments, was released for a 30-day public review and comment period on May 24, 1993. In response to comments received regarding the Draft EA, some components of the proposed project were modified. Subsequently, a Revised Draft EA was prepared and re-circulated for an additional public review and comment period of 45 days on July 22, 1993 The SCAQMD concluded that the changes in the Revised Draft EA did not alter the significance determination for any environmental impact areas analyzed in the May 1993 version of the Draft EA. After circulation of the Revised Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board at its hearing in October 1993.

Notice of Preparation/Initial Study of Draft Environmental Assessment for the Proposed Adoption of Regulation XX - RECLAIM; October 1992: The NOP/IS of a Draft EA for the proposed adoption of the NOx and SOx RECLAIM program was released for a 30-day public review and comment period on October 23, 1992. The NOP/IS identified "air quality," "energy," and "hazards and hazardous materials" as the key areas that may be adversely affected by the proposed project.

1.3 INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers and the public generally of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this Draft PEA is intended to: a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental effects of the proposed project; and, b) be used as a tool by the SCAQMD Governing Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124 (d)(1) requires a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the PEA in their decision-making;
2. A list of permits and other approvals required to implement the project; and,

3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

There are no permits or other approvals required to implement the project. Moreover, the project is not subject to any other related environmental review or consultation requirements.

However, if an affected facility chooses to install new equipment or modify existing equipment, then SCAQMD permits, as well as other agency permits or other approvals depending on the physical changes being proposed, may also be required. To the extent that local public agencies, such as cities, county planning commissions, et cetera, are responsible for making land use and planning decisions related to projects proposed as a result of implementing the proposed project, they could possibly rely on this PEA during their decision-making process. Similarly, other single purpose public agencies approving projects at facilities complying with the proposed project may rely on this PEA. If the applicable lead agency finds that no new effects could occur, or no new mitigation measures would be required, the lead agency can approve the activity as being within the scope of the project covered by the PEA and no new environmental document would be required (CEQA Guidelines §15168 (c)(2)). If there are proposed activities that would have effects that were not examined in the PEA, then depending on the types of activities proposed by the affected facility and where the project is located, the appropriate lead agency would need to prepare an additional CEQA document to analyze the additional effects.

1.4 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 proposed project, the predominant concerns expressed by representatives of industry and environmental groups, either in public meetings or in written comments, regarding the proposed project are highlighted in Table 1-1.

Table 1-1
Areas of Controversy

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
1.	Amount of proposed NOx shave and availability of RTCs	Industry representatives expressed concern that reducing the available NOx RTCs by the proposed amount would have severe impacts on the NOx RECLAIM program because there will not be enough NOx RTCs in the market.	The staff analysis shows that after the proposed shave is imposed, there will be sufficient NOx RTCs available to maintain trading within the NOx RECLAIM program given foreseeable opportunities for emissions reductions. Furthermore, the proposed NOx shave provides for a compliance margin and the NOx program includes provisions for adjustments if the price of RTCs exceeds certain thresholds.

Table 1-1 (continued)
Areas of Controversy

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
2.	Equity of proposed NOx shave	NOx reductions should be based on facility-specific and technology-specific data, or, as others have commented, should be applied evenly across the all facilities. Many facilities cannot reduce NOx further. Other facilities do not have equipment subject to BARCT.	The proposed shave is based on source categories for which additional NOx reductions can be achieved in a cost-effective manner. It recognizes 210 facilities hold 10 percent of the 26.5 tpd of the available NOx RTCs, and that for these facilities, no NOx RTC shave is proposed because no new BARCT (not cost effective and/or infeasible) was identified, or gains in emission reductions would be negligible, for the types of equipment and source categories.
3.	Results of the BARCT analysis	The SCAQMD's consultant's report assessing the staff BARCT analysis recommended alternate engineering assumptions in certain areas.	While staff believes the engineering assumptions in the staff BARCT analysis are appropriate, the difference in BARCT reductions attributable to the alternate engineering assumptions suggested by the consultant is relatively small. To account for this difference and to provide a compliance margin, staff is proposing a shave of 14 tpd, reduced from the initial BARCT result of 14.85 tpd.
4.	Equivalency with command-and-control	The NOx RTC shave BARCT reductions of 8.79 should be applied to the total RTC holdings rather than to the actual emissions in order to maintain the viability of the market	The total shave amount of 14 tpd is applied to total RTCs holdings. Consistent with previous RECLAIM rule amendments, the California Health & Safety Code, and the purpose of the program, BARCT implementation seeks to reduce actual emissions rather than RTC holdings. This approach will result in approximately 8.79 tons per day of BARCT reductions of actual NOx emissions attributable to installing and operating additional controls. Otherwise, actual emissions reductions of only about two tpd over the next seven years would be achieved.

Table 1-1 (continued)
Areas of Controversy

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
5.	2012 AQMP Commitment in the State Implementation Plan (SIP)	The control measure CMB-01 in the 2012 AQMP committed only three to five tpd NOx emission reductions but this rule development is seeking a higher amount of NOx reductions beyond what was committed in the SIP.	The staff proposal is the result of a much more rigorous and in-depth analysis as compared to the analysis that supported control measure CMB-01. For a market-based incentive program, SCAQMD staff is required by the California Health and Safety Code to conduct periodic BARCT reassessments and demonstrate equivalency with command-and-control rules which would otherwise be developed as a result of BARCT reassessment. CMB-01 anticipated this BARCT assessment but could not predict the results of the assessment, and therefore made commitments for a more modest reduction. This staff proposal recommends a reasonably available 14 tpd of NOx RTC reductions, based on BARCT, as required by state law, and which are needed to help the Basin achieve the PM2.5 standards by 2019 and 2025 and the ozone standards by 2024 and 2032.

Table 1-1 (concluded)
Areas of Controversy

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
6.	Availability of RTCs for future power plant needs	There may not be enough available RTCs after the shave for power producers to provide a reliable supply of electricity over the short-term (e.g., during high demand events such as a heat wave) and over the long-term (e.g., increased use in electricity needed to power electric vehicles).	The staff proposal would establish a separate adjustment account to hold RTCs for power plants to meet their NSR holding obligations. Many newer peaking plants are required to hold RTCs at the potential to emit level each year even though their actual emissions are far below this level. The adjustment account would relieve power producing facilities from the obligation of holding RTCs in order to meet the NSR holding requirements of Rule 2005. RTCs would still be required for the purpose of reconciling annual emissions. Furthermore, if the demand for power results in a severe shortage that would lead to the state Governor declaring a state of emergency, a power producing facility would be able to access the adjustment account for non-tradable credits to offset annual emissions.

Pursuant to CEQA Guidelines §15131 (a), "Economic or social effects of a project shall not be treated as significant effects on the environment." CEQA Guidelines §15131 (b) states further, "Economic or social effects of a project may be used to determine the significance of physical changes caused by the project." Physical changes caused by the proposed project have been evaluated in Chapter 4 of this PEA. No direct or indirect physical changes resulting from economic or social effects have been identified as a result of implementing the proposed project.

Of the topics discussed to address the concerns raised relative to CEQA and the secondary impacts that would be associated with implementing the proposed project, to date, no other controversial issues were raised as a part of developing the proposed project.

1.5 EXECUTIVE SUMMARY

CEQA Guidelines §15123 requires a CEQA document to include a brief summary of the proposed actions and their consequences. In addition, areas of controversy including issues raised by the public must also be included in the executive summary (see preceding discussion). This Draft PEA consists of the following chapters: Chapter 1 – Executive Summary; Chapter 2 – Project Description; Chapter 3 – Existing Setting, Chapter 4 – Potential Environmental Impacts and Mitigation Measures; Chapter 5 – Project Alternatives; Chapter 6 - Other CEQA Topics and various appendices. The following subsections briefly summarize the contents of each chapter.

Summary of Chapter 1 – Executive Summary

Chapter 1 includes a discussion of the legislative authority that allows the SCAQMD to amend and adopt air pollution control rules, identifies general CEQA requirements and the intended uses of this CEQA document, and summarizes the remaining chapters that comprise this Draft PEA.

Summary of Chapter 2 - Project Description

To comply with the requirements in HSC §§40440 and 39616, SCAQMD staff conducted a BARCT assessment of the NOx RECLAIM program which resulted in adjusting BARCT levels for both equipment and source categories in the refinery and non-refinery sectors. For the refinery sector, a new level of BARCT is proposed for FCCUs, refinery boilers/heaters rated great than 40 mmBTU/hr, refinery gas turbines, coke calciners, and SRU/TGUs. For the non-refinery sector, a new BARCT level is proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal heat treating furnaces rated great than 150 mmBTU/hr, gas turbines and ICEs not located on the outer continental shelf (OCS). No new BARCT is proposed for power plants. Overall, a total of 14 tpd of NOx RTC reductions from the current 2015 RTC holdings of 26.5 tpd is proposed to be implemented over a seven-year period from 2016 to 2022.

For the 275 facilities that are in the NOx RECLAIM program, the 14 tpd of NOx RTC reductions will be reduced from the allocations of 65 facilities plus the investors that, together, hold 90 percent of the NOx RTC holdings. Investors are included in the refinery sector and treated as one facility. For the remaining 210 facilities that hold 10 percent of the 26.5 tpd of the NOx RTCs, no NOx RTC shave is proposed because no new BARCT (not cost effective and/or infeasible) was identified for the types of equipment and source categories at these facilities. By following this approach, the shave is distributed as follows:

- 67% shave for 9 refineries and investors (treated as one facility)
- 47% shave for 30 power plants
- 47% shave for 26 non-major facilities
- 0% shave for 210 remaining facilities

In addition, the overall NOx RTC reductions of 14 tpd are expected to be achieved incrementally from 2016 to 2022, according to the following implementation schedule:

- 2016 – 4 tons per day
- 2018 – 2 tons per day
- 2019 – 2 tons per day
- 2020 – 2 tons per day
- 2021 – 2 tons per day
- 2022 – 2 tons per day

To incorporate the proposed NOx RTC shave and implementation schedule, amendments to the NOx RECLAIM regulation are proposed to establish procedures and criteria for reducing NOx RECLAIM RTCs and NOx RTC adjustment factors for year 2016. The proposed amendments contain the following key elements:

- Amend Rule 2002 - Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), to establish procedures and criteria for reducing NOx RTCs and NOx RTC adjustment factors for year 2016 and later.
- Amend Rule 2002 to add new BARCT emission factors ending in 2021 for an assortment of equipment/process categories.
- Amend Rule 2005 – New Source Review for RECLAIM, to clarify the criteria for how Adjustment Account RTCs are treated when conducting a New Source Review analysis for RECLAIM facilities.
- Amend Rule 2011 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Sulfur (SOx) Emissions (Attachment C – Quality Assurance and Quality Control Procedures)
- Amend Rule 2012 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Nitrogen (NOx) Emissions (Attachment C – Quality Assurance and Quality Control Procedures)
- Make administrative and other minor changes such as correcting typographical errors as well as clarifying and updating the rule and rule protocol language for consistency.

Other minor changes are proposed for clarity and consistency throughout the proposed amended regulation. A copy of the proposed amended Rules (PAR) 2002 and 2005 can be found in Appendices A and B, respectively, of this Draft PEA. A copy of the proposed amended protocols for Rules 2011 and 2012 can be found in Appendices C and D, respectively.

Summary of Chapter 3 - Existing Setting

Pursuant to the CEQA Guidelines §15125, Chapter 3 – Existing Setting, includes descriptions of those environmental areas that could be adversely affected by the proposed project as identified in the NOP/IS (Appendix F). The following environmental areas identified in the NOP/IS that could potentially be adversely affected by implementing the proposed project are: aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic. As such, Chapter 3 contains subchapters devoted to describing the existing setting for each environmental topic area evaluated in the PEA.

Summary of Chapter 4 - Environmental Impacts

CEQA Guidelines §15126 (a) requires that a CEQA document shall identify and focus on the "significant environmental effects of the proposed project." Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects.

The NOP/IS identified and described those environmental topics where the proposed project could cause significant adverse environmental impacts (e.g., aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic). The type of emission reduction projects that may be undertaken to comply with the proposed project is the main focus of the analysis in this PEA. There are multiple source categories with multiple approaches to reducing NOx emissions. With so many possibilities or permutations of how operators of NOx RECLAIM facilities could achieve actual NOx reductions, there is no way to predict what each facility operator will do. For this reason, the proposed project analysis has been crafted to illustrate the worst-case effects of applying the various NOx control technologies along with demonstrating the flexibility that is provided by the RECLAIM program to facility operators when it comes to choosing the methods for reducing NOx emissions. The analysis focuses on the installation and operation of NOx control technologies for the various equipment types/source categories.

The following subsections briefly summarize the analysis of potential adverse environmental impacts from the implementation of the proposed project.

Aesthetics

Physical modifications may result as part of implementing the proposed project and will vary depending on the equipment source category/process. The analysis in this CEQA document is based on the assumption that new air pollution control equipment is expected to be installed and existing air pollution control equipment is expected to be modified as part of implementing the proposed project. Aesthetic impacts associated with the installation of new or the modification of existing NOx control, were identified in the NOP/IS to be potentially significant and, as such, are evaluated in this PEA.

Implementation of the proposed project is expected to result in construction activities at some or all of the affected facilities, which are complex industrial facilities. Due to the large size profiles of the affected equipment, the construction activities associated with installing control equipment are expected to require the use of heavy-duty construction equipment, such as cranes, which may temporarily change the skyline of the affected facilities, depending on where they are located within each facility's property. However, because each affected facility is located in a heavy industrial area, the construction equipment is not expected to be substantially discernable from what would be needed for routine operations and maintenance activities. For these reasons, the construction activities are expected to blend in with the existing industrial environment and thus, are not expected to affect the visual continuity of the surrounding areas.

In addition, for any installation of a WGS, operational aesthetic impacts resulting from a substantial visible steam (water vapor) plume that would emanate from the WGS stack were evaluated in this PEA. The analysis will show that if any WGS is installed as part of the proposed project at any of the affected facilities, the steam plume, though visible, is not expected to significantly adversely affect the visual continuity of the surrounding area of each affected facility because no scenic highways or corridors exist within the areas of the refineries, the coke calciner, the sulfuric acid plants and the glass melting plant. Further, the visual continuity of the surrounding area is not expected to be adversely impacted because each WGS, if constructed, will be built within the confines of industrial areas and would be visually consistent with the profiles of the existing affected facilities. Thus, even if each WGS could be visible, depending on the location within each property boundary, the aesthetic significance criteria would not be exceeded. For these reasons, less than significant aesthetics impacts during operation are expected from the proposed project.

Overall, the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project.

Air Quality and Greenhouse Gases

The proposed project is expected to result in a total of 14 tpd of NOx RTC reductions from the current RTC holdings of 26.5 tpd, to be implemented over a seven-year period from 2016 to 2022. For the 275 facilities that are in the NOx RECLAIM program, the 14 tpd of NOx RTC reductions will affect 65 facilities plus the investors, who collectively hold 90 percent of the NOx RTC holdings. Investors are included in the refinery sector and treated as one facility. For the remaining 210 facilities that hold 10 percent of the 26.5 tpd of the NOx RTCs, no NOx RTC shave is proposed because no new BARCT (not cost effective and/or infeasible) was identified for the types of equipment and source categories at these facilities. By following this approach, the shave of NOx RTC holdings is distributed as follows:

- 67% shave for 9 refineries and investors (treated as one facility)
- 47% shave for 30 power plants
- 47% shave for 26 non-major facilities
- 0% shave for 210 remaining facilities

SCAQMD staff has conducted a BARCT analysis for all 275 facilities and of these, 30 power producing facilities were shown to operate at current BARCT or BACT levels. For 224 non-power plant facilities, either no new BARCT was identified or the installation of control equipment was determined to not be cost-effective. Further, only 44 facilities are expected to comply with the proposed NOx RTC shave through the purchase of RTCs which will have no environmental impact.

To reduce NOx from the remaining 21 facilities (e.g, 275 – 30 power producers -224 non-power plant facilities = 21) which are either major or large sources of NOx for which new BARCT has been identified, the BARCT analysis found that it would be both feasible and cost-effective for facility operators to install new control equipment or modify existing control equipment at 20 facilities with 11 facilities belonging to the non-refinery sector and 9 facilities belonging to the refinery sector.

As a result, operators of these 20 facilities may choose to modify existing equipment by retrofitting with air pollution control technologies in order to comply with the shave of NOx RTCs. The physical changes involved that may occur as a result of implementing the proposed project focus on the installation of new or the modification of existing control equipment on the following types of equipment and processes: 1) fluid catalytic cracking units; 2) refinery boilers and heaters; 3) refinery gas turbines; 4) sulfur recovery units – tail gas treatment units; 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant internal combustion engines; 8) container glass melting furnaces; 9) coke calcining; and, 10) metal heat treating furnaces. Table 1-2 summarizes the potential NOx control technologies that may be considered as part of implementing the proposed project.

Table 1-2

Potential NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Potential NOx Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	SCR LoTOx^{TM} with WGS LoTOx^{TM} without WGS
Refinery	Refinery Process Heaters and Boilers	SCR
Refinery	Refinery Gas Turbines	SCR
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	LoTOx^{TM} with WGSs SCR
Refinery	Petroleum Coke Calciner	LoTOx^{TM} with WGS UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	SCR UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	SCR UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	SCR
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	SCRs

Construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts for criteria pollutants. In addition, operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies and the removal of waste from the control processes for disposal or recycling are also expected and have the potential to generate significant adverse air quality impacts for NOx and greenhouse gases (GHGs).

With regard to GHG emissions, the proposed project involves combustion processes which could generate GHG emissions such as CO2, CH4, and N2O. However, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs. Implementing the proposed project is expected to increase GHG emissions that exceed the SCAQMD's GHG significance threshold for industrial sources. In addition, implementing the proposed project is expected to generate significant adverse cumulative GHG air quality impacts.

Energy

Implementation of the proposed project is expected to increase the amount of energy needed to both construct and operate the new and modified air pollution control devices. During construction, increased use of diesel fuel and gasoline are expected from on- and off-road vehicle and equipment use. Operational activities of the new and modified air pollution control equipment are expected to result in an overall increase in electricity as well as an increased use of diesel fuel associated with supply delivery trips and waste removal trips as part of day-to-day operations. Despite the potential increases in energy use overall as part of implementing the proposed project, the increases are not expected to exceed the energy significance thresholds.

Hazards and Hazardous Materials

Implementation of the proposed project may alter the hazards and hazardous materials associated with the existing facilities affected by the proposed project. Air pollution control equipment and related devices are expected to be installed or modified at affected facilities such that their operations may increase the quantity of materials used in the control equipment, some of which are hazardous. For example, the proposed project could result in the increased use of hazardous materials such as ammonia and sodium hydroxide and non-hazardous materials such as soda ash and hydrated lime. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of the proposed project. The hazards analysis focuses on the materials used that may be hazardous. The analysis concluded that the proposed project is expected to generate significant adverse hazards and hazardous materials impacts for ammonia deliveries and less than significant hazards and hazardous materials impacts for ammonia use and storage. For the substances other than ammonia that were identified as hazardous, the proposed project is expected to generate less than significant hazards and hazardous materials impacts.

Hydrology and Water Quality

Implementation of the proposed project may cause hydrology and water quality impacts associated with the existing facilities affected by the proposed project. Specifically, the installation of WGS technology involves an increased demand for water and an increased amount of wastewater discharge. None of the other NOx control technologies contemplated by the proposed project are expected to create hydrology and water quality impacts.

For water demand, there are three significance thresholds based on whether: 1) the total water demand of the proposed project is less than five million gallons per day; 2) the existing water supply has the capacity to meet the increased demands of the proposed project; and, 3) the potable water demand is less than 262,820 gallons per day. The analysis shows that the increased potential demand for total water that may result from implementing the proposed project either during construction or operation is not expected to exceed the significance threshold of five million gallons of total water demand per day.

The analysis shows a potential increase in water use of 353,724 gallons per day for all 20 facilities conducting hydrotesting activities on a peak day. The amount of water that may be needed to conduct hydrotesting on a peak day is greater than the SCAQMD's significance threshold of 262,820 gallons per day of potable water. Thus, the amount of potable water that may be used on a daily basis for hydrotesting activities post-construction but prior to operation is potentially significant.

The analysis also shows a potential increase in water use for facilities that utilize WGS technology would be 602,1854 gallons per day, which exceeds the SCAQMD's significance threshold of 262,820 gallons per day of potable water. Thus, the amount of potable water that may be used on a daily basis for operating NOx control equipment (e.g., WGSs) is also potentially significant.

Because the entire state of California is in the midst of a severe drought and because construction of WGS technology may not occur for at least another year or more, it is not clear if the local water suppliers will have enough potable water to meet the increased demands to supply the WGSs in the future. While the use of recycled water may be able to offset some of the potable water demands from the proposed project, not all of the facilities whose storage tanks need hydrotesting and whose operations are potential candidates for WGS technology, have current access to recycled water. For this reason, the analysis concludes that the amount of water that may be needed to hydrotest storage tanks and to operate WGS technology may create significant adverse hydrology (water demand) impacts.

Relative to water quality, the analysis will also show that implementing the proposed project may increase the amount of wastewater discharged from certain affected facilities. However, the potential increases will not cause a permit revision to any affected facility's wastewater permit and as such, will not exceed the wastewater significance threshold. For this reason, the wastewater impacts from the proposed project are expected to be less than significant.

Solid and Hazardous Waste

Construction activities associated with installing NOx control equipment such as demolition and site preparation/grading/excavating could generate solid waste as result of implementing the proposed project. However, the amount of debris generated during construction at 20 facilities would not be expected to exceed the designated capacity of local landfills. For this reason, the construction impacts of the proposed project on waste treatment/disposal facilities were concluded to be less than significant. Solid waste may also be generated from the operation of the new NOx air pollution control equipment at both the refinery and non-refinery facilities. Further, it is possible that some, if not all, of the 20 affected facilities will address any increase in waste through their existing waste minimization plans. For example, some of the affected facilities in both the refinery and non-refinery sectors currently have existing catalyst-based operations and the spent catalysts are either regenerated, reclaimed or recycled, in lieu of disposal, and this practice would be expected to continue. The overall impacts of the proposed project on waste treatment/disposal facilities due to solid waste that may be generated from both refinery and non-refinery facilities during construction and operation were concluded to be less than significant.

Transportation and Traffic

Implementation of the proposed project may cause adverse transportation and traffic impacts associated with the existing facilities affected by the proposed project. Specifically, construction-based traffic associated with the installation of NOx control technology is expected from construction workers, delivery trucks and haul trucks. During operation of the proposed project, regular deliveries and waste disposal activities are also expected to increase at each of the affected facilities. Despite the increases, the analysis shows that the transportation and traffic impacts, though adverse, are less than significant for the proposed project during both construction and operation.

Potential Environmental Impacts Found Not To Be Significant

The NOP/IS for the proposed project included an environmental checklist of approximately 17 environmental topics to be evaluated for potential adverse impacts from a proposed project. Review of the proposed project at the NOP/IS stage identified seven topics (e.g., aesthetics; air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic), for further review in the Draft PEA. Where the NOP/IS concluded that the project would have no significant direct or indirect adverse effects on the remaining environmental topics, of the comments received on the NOP/IS or at the public meetings, none of the comments changed this conclusion. The screening analysis concluded that the following environmental areas would not be significantly adversely affected by the proposed project:

- agriculture and forestry resources
- biological resources
- cultural resources
- geology and soils
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation

The NOP/IS for the proposed project was circulated for a 57-day review and comment period from December 5, 2014 to January 30, 2015. At the time the NOP/IS was circulated, the environmental checklist did not include tribal cultural resources as a topic to be evaluated under Cultural Resources as part of a CEQA document. However, the requirements of California Assembly Bill (AB 52) went into effect on July 1, 2015. AB 52 is promulgated in Public Resources Code §21080.3.1 (d) and requires a formal notification to all California Native American Tribes about lead agency projects that would require the preparation of a CEQA document. While the Office of Planning and Rule (OPR) has until July 1, 2016 to finalize the implementation guidance for this requirement, the SCAQMD is required to comply with AB 52 in the interim.

Subsequent to release of the NOP/IS, modifications were made to the environmental checklist (e.g., a new question was added), significance criteria, and discussion of Cultural Resources impacts in response to the requirements in AB 52 to consider the proposed project's potential effects on Cultural Native American Tribe resources. Although the NOP/IS did not include a preliminary analysis of tribal cultural resources, to make the analysis of environmental impacts consistent with the recent changes to the environmental checklist, a discussion of impacts from the proposed project relative to tribal cultural resources has been included in this subchapter of the Draft PEA. No significant impacts on tribal cultural resources were identified. Thus, even with the additional information pertaining to tribal cultural resources, the overall conclusion of "No Impact" for this topic area remains unchanged.

<u>Other CEQA Topics</u>

CEQA documents are required to address the potential for irreversible environmental changes, growth-inducing impacts and inconsistencies with regional plans. The analysis confirms that proposed project would not result in irreversible environmental changes or the irretrievable commitment of resources, foster economic or population growth or the construction of additional housing, or be inconsistent with regional plans.

Summary Chapter 5 - Alternatives

The proposed project and five alternatives to the proposed project are summarized in Table 1-3: Proposed Project (Shave Applied to 90 percent of RTC Holders – 65 facilities), Alternative 1 (Across the Board), Alternative 2 (Most Stringent), Alternative 3 (Industry Approach), Alternative 4 (No Project), and, Alternative 5 (Weighted by BARCT Reduction Contribution for all facilities and investors). Pursuant to the requirements in CEQA Guidelines §15126.6 (b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potentially significant adverse impacts from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 1-4. In addition to the topic of the topics of air quality and GHGs, the alternatives comparison in Table 1-4 addresses the topics of aesthetics, energy, hazards and hazardous materials, hydrology and water quality, solid and hazardous waste, and transportation and traffic. Aside from these topics, no other potentially significant adverse impacts were identified for the proposed project or any of the project alternatives. The proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to construction and operation activities while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 1-3
Summary of Proposed Project & Alternatives

Components of Proposed Project		Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	NOx Reduction Potential *(tons/day)*	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	NOx Reduction Potential *(tons/day)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	NOx Reduction Potential *(tons/day)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	NOx Reduction Potential *(tons/day)*
Proposed NOx RTC "Shave"			**14.00**		**14.00**		**15.87**		**8.00**
Basic Equipment	**BARCT**								
FCCU	SCR or LoTOx™ with WGS	2 ppmv NOx at 3% O2	0.43	Same as proposed project	0.43	Same as proposed project	0.43	Same as proposed project	0.43
Refinery Boilers/ Heaters	SCR	2 ppmv NOx, or 0.002 lb NOx/mmBTU	0.96	Same as proposed project	0.96	Same as proposed project	0.96	Same as proposed project	0.96
Refinery Gas Turbines	SCR or SCR Catalyst	2 ppmv NOx at 15% O2	4.14	Same as proposed project	4.14	Same as proposed project	4.14	Same as proposed project	4.14
SRU/TGU	LoTOx™ with WGS or SCR	2 ppmv NOx at 3% O2, or 95% reduction	0.32	Same as proposed project	0.32	Same as proposed project	0.32	Same as proposed project	0.32
Coke Calciner	LoTOx™ with WGS or Ultracat DGS	10 ppmv at 3% O2	0.17	Same as proposed project	0.17	Same as proposed project	0.17	Same as proposed project	0.17
Glass Melting Furnace	SCR or Ultracat DGS	80% reduction, or 0.024 lb NOx per ton glass produced	0.24	Same as proposed project	0.24	Same as proposed project	0.24	Same as proposed project	0.24
Sodium Silicate Furnace	SCR or Ultracat DGS (without dry sorbent)	80% reduction, or 1.28 lb NOx per ton of glass pulled	0.09	Same as proposed project	0.09	Same as proposed project	0.09	Same as proposed project	0.09
Metal Heat Treating Furnace	SCR	9 ppmv at 3% O2, or 0.011 lb NOx/mmBTU	0.56	Same as proposed project	0.56	Same as proposed project	0.56	Same as proposed project	0.56
ICEs (Non-Refinery/Non-Power Plant)	SCR	11 ppmv NOx at 15% O2, 0.041 lb NOx/mmBTU, or 43.05 lb NOx/MMcf	0.84	Same as proposed project	0.84	Same as proposed project	0.84	Same as proposed project	0.84
Gas Turbines (Non-Refinery/ Non-Power Plant)	SCR	2 ppmv NOx at 15% O2	1.04	Same as proposed project	1.04	Same as proposed project	1.04	Same as proposed project	1.04
Potential NOx Emission Reductions (BARCT)			**8.79**		**8.79**		**8.79**		**8.79**
NOx RTCs Needed to Fulfill Shave Post-BARCT			**5.21**		**5.21**		**7.08**		**0**

Key: SCR = Selective Catalytic Reduction; WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber
ppmv = parts per million by volume; mmBTU = million British Thermal Units; MMcf = million cubic feet

Table 1-3 (concluded)
Summary of Proposed Project & Alternatives

Components of Proposed Project		**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**NOx Reduction Potential** *(tons/day)*	**Alternative 4: No Project**	**NOx Reduction Potential** *(tons/day)*	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**	**NOx Reduction Potential** *(tons/day)*
Proposed NOx RTC "Shave"			**14.00**		**0**		**14.00**
Basic Equipment	**BARCT**						
FCCU	SCR or LoTOx™ with WGS	2 ppmv NOx at 3% O2	0.43	No NOx limit	0	Same as proposed project	0.43
Refinery Boilers/ Heaters	SCR	2 ppmv NOx, or 0.002 lb NOx/mmBTU	0.96	No NOx limit	0	Same as proposed project	0.96
Refinery Gas Turbines	SCR or SCR Catalyst	2 ppmv NOx at 15% O2	4.14	No NOx limit	0	Same as proposed project	4.14
SRU/TGU	LoTOx™ with WGS	2 ppmv NOx at 3% O2, or 95% reduction	0.32	No NOx limit	0	Same as proposed project	0.32
Coke Calciner	LoTOx™ with WGS or Ultracat DGS	10 ppmv at 3% O2	0.17	No NOx limit	0	Same as proposed project	0.17
Glass Melting Furnace	SCR or Ultracat DGS	80% reduction, or 0.024 lb NOx per ton glass produced	0.24	No NOx limit	0	Same as proposed project	0.24
Sodium Silicate Furnace	SCR or Ultracat DGS (without dry sorbent)	80% reduction, or 1.28 lb NOx per ton of glass pulled	0.09	No NOx limit	0	Same as proposed project	0.09
Metal Heat Treating Furnace	SCR	9 ppmv at 3% O2, or 0.011 lb NOx/mmBTU	0.56	No NOx limit	0	Same as proposed project	0.56
ICEs (Non-Refinery/Non-Power Plant)	SCR	11 ppmv NOx at 15% O2, 0.041 lb NOx/mmBTU, or 43.05 lb NOx/MMcf	0.84	No NOx limit	0	Same as proposed project	0.84
Gas Turbines (Non-Refinery/ Non-Power Plant)	SCR	2 ppmv NOx at 15% O2	1.04	No NOx limit	0	Same as proposed project	1.04
Potential NOx Emission Reductions			**8.79**		**0**		8.79
NOx RTCs Needed to Fulfill Shave Post-BARCT			**5.21**		**0**		**5.21**

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber

Key: SCR = Selective Catalytic Reduction; WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber

ppmv = parts per million by volume; mmBTU = million British Thermal Units; MMcf = million cubic feet

Table 1-4

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Aesthetics	Visible steam plumes and new, tall stacks from installing/operating up to 8 WGSs at 7 facilities as follows: FCCU: 2 WGSs SRU/TGU: 5 WGSs Coke Calciner: 1 WGS	Same as proposed project	Same as proposed project, but if facility operators install additional WGSs beyond what is analyzed for the proposed project to obtain a compliance margin, then additional steam plumes and tall stacks could occur.	Less than proposed project	No installation of WGSs (e.g., no visible steam plumes and no new, tall stacks) expected	Same as proposed project
Aesthetics Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project, but potentially more adverse aesthetics impacts if facility operators install additional WGSs beyond what is analyzed for the proposed project)	Less than significant (less than proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)
Air Quality & GHGs	• Reduces total operational NOx emissions by 8.79 tpd • Reduces total NOx RTC holdings by 14.0 tpd • Unused NOx RTCs to be applied to shave is 5.21 tpd • Increases total GHGs by: - 41,785 MT/yr without mitigation; & - 41,100 MT/yr with mitigation • Increases operational use of NaOH (a TAC) by 5.84 tpd	Same as proposed project	• Reduces total operational NOx emissions by 8.79 tpd • Reduces total NOx RTC holdings by 15.87 tpd • Unused NOx RTCs to be applied to shave is 7.08 tpd • Increases total GHGs by: - 41,785 MT/yr without mitigation; & - 41,100 MT/yr with mitigation • Increases operational use of NaOH (a TAC) by 5.84 tpd	• Less operational NOx reductions than proposed project but not quantifiable • Reduces total NOx RTC holdings by 8.00 tpd • Less increases to GHGs than proposed project, but not quantifiable before or after mitigation • Less increases in operational use of NaOH (a TAC) but not quantifiable	• No decreases in total operational NOx emissions. • No increases in construction emissions for any pollutant.	Same as proposed project

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Air Quality & GHGs (concluded)	• Increases operational use of NH3 (a TAC) by 39.5 tpd • Increases peak daily operation emissions as follows: VOC: 17 lb/day CO: 75 lb/day NOx: 190 lb/day* PM10: 22 lb/day PM2.5: 19 lb/day • Increases peak daily emissions for construction in same year as follows: VOC: 429 lb/day CO: 2,745 lb/day NOx: 1,656 lb/day SOx: 3 lb/day PM10: 1,758 lb/day without mitigation; & 1,009 lb/day with mitigation PM2.5: 883 lb/day without mitigation; & 508 lb/day with mitigation	Same as proposed project	• Increases operational use of NH3 (a TAC) by 39.5 tpd Increases peak daily operation emissions as follows: VOC: 17 lb/day CO: 75 lb/day NOx: 190 lb/day* PM10: 22 lb/day PM2.5: 19 lb/day • Increases peak daily emissions for construction in same year as follows: VOC: 429 lb/day CO: 2,745 lb/day NOx: 1,656 lb/day SOx: 3 lb/day PM10: 1,758 lb/day without mitigation; & 1,009 lb/day with mitigation PM2.5: 883 lb/day without mitigation; & 508 lb/day with mitigation • If additional controls are installed beyond the proposed project for a compliance margin, more emission benefits as well as increased emissions impacts could occur.	• Less increases in operational use of NH3 (a TAC) but not quantifiable • Less increases in peak daily operation emissions but not quantifiable • Less increases in peak daily emissions for construction but not quantifiable with or without mitigation	• No decreases in total operational NOx emissions • No increases in construction emissions for any pollutant.	Same as proposed project

* The potential increases in NOx operational emissions are more than offset by the overall project reductions.

Table 1-4 (continued)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Air Quality & GHG Impacts Significant?	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd. • Less than significant for VOC, CO, PM10 and PM2.5 during operation • Significant for GHGs • Less than significant for TACs use (NaOH and NH3) during operation • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd (same as proposed project) • Less than significant for VOC, CO, PM10 and PM2.5 during operation (same as proposed project) • Significant for GHGs (same as proposed project) • Less than significant for TACs use (NaOH and NH3) during operation (same as proposed project) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (same as proposed project)	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd (same as proposed project) • Less than significant for VOC, CO, PM10 and PM2.5 during operation (same as proposed project) • Significant for GHGs (same as proposed project) • Less than significant for TACs use (NaOH and NH3) during operation (same as proposed project) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (same as proposed project) • If additional controls are installed beyond the proposed project for a compliance margin, more emission benefits and increased emissions could occur.	• Less than significant; achieves net NOx emission reductions during operation (less reductions than the proposed project but not quantifiable) • Less than significant increases in VOC, CO, PM10 and PM2.5 during operation (less than the proposed project but not quantifiable) • Significant for GHGs, (less than proposed project but not quantifiable) • Less than significant for TACs use (NaOH and NH3) during operation (less than the proposed project but not quantifiable) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (less than proposed project but not quantifiable)	• No Impact - Not Significant • Does not achieve required AQMP NOx emission reductions during operation • Does not comply with BARCT assessment requirements per Health and Safety Code	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd (same as proposed project) • Less than significant for VOC, CO, PM10 and PM2.5 during operation (same as proposed project) • Significant for GHGs(same as proposed project) • Less than significant for TACs use (NaOH and NH3) during operation (same as proposed project) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (same as proposed project)

Table 1-4 (continued)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**Alternative 1: Across the Board Shave** ***(All facilities reduce 53%)***	**Alternative 2: Most Stringent Shave** ***(All facilities reduce 60%)***	**Alternative 3: Industry Approach** ***(All facilities reduce 33%)***	**Alternative 4: No Project**	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**
Energy	• During construction: -Increased use of diesel by 15,855 gal/day -Increase use of gasoline by 5,422 gal/day • During operation: -Increased use of electricity by 214 MWh/day -Increased use of diesel by 8,380 gal/day	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, increased energy use during construction and operation could occur	Less than the proposed project	No increases in energy uses during construction or operation	Same as proposed project
Energy Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased energy use than the proposed project could occur.)	Less than significant (less than the proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)
Hazards & Hazardous Materials	Increased use of 5.84 tons/day of NaOH and 39.5 tons/day of NH3 (both TACs) used during operation.	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional NaOH and NH3 may be needed.	Less than the proposed project	No change to existing hazards and hazardous materials used	Same as proposed project
Hazards & Hazardous Materials Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased use of NaOH and NH3 could occur.)	Less than significant	No Impact - Not Significant	Less than significant (same as proposed project)

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**Alternative 1: Across the Board Shave** ***(All facilities reduce 53%)***	**Alternative 2: Most Stringent Shave** ***(All facilities reduce 60%)***	**Alternative 3: Industry Approach** ***(All facilities reduce 33%)***	**Alternative 4: No Project**	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**
Hydrology & Water Quality	• During construction: -Increased use of water for dust suppression by 12,501 gal/day -Increased use of water for hydrotesting by 353,724 gal/day • During operation -Increased use of potable water by 602,814 gal/day (of which up to 204,047 gal/day could potentially be supplied by recycled water) -Increased generation of wastewater by 236,719 gal/day.	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional water demand and increased wastewater generation may occur.	Less than the proposed project	No change to existing water demand or wastewater discharge	Same as proposed project
Hydrology & Water Quality Impacts Significant?	• Significant for water demand during hydrotesting (assuming entire demand is based on potable water) • Significant for water demand during operation (assuming entire demand is based on potable water) • Less than significant for water demand during construction • Less than significant for wastewater discharge during construction and operation	-Significant for water demand (same as proposed project) -Less than significant for wastewater discharge (same as proposed project)	-Significant for water demand (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased use of water during construction and operation may be needed) -Less than significant for wastewater discharge (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, then additional wastewater may be discharged	-Significant for water demand (less than proposed project) -Less than significant for wastewater discharge (less than proposed project)	No Impact - Not Significant	-Significant for water demand (same as proposed project) -Less than significant for wastewater discharge (same as proposed project)

Table 1-4 (concluded)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Solid & Hazardous Waste	• During construction: -Increased generation of non-hazardous solid waste • During operation: -Increased generation of non-hazardous solid waste that can be recycled	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional solid waste may be generated.	Less than the proposed project	No change to existing disposal of solid & hazardous waste	Same as proposed project
Solid & Hazardous Waste Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased use of water during construction and operation may be needed)	Less than significant (less than the proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)
Transportation & Traffic	Overall peak increase in transportation and traffic of 485 trips per day during construction and 65 trips per day during operation.	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional daily trips during construction and operation may be needed.	Less than the proposed project	No change to existing transportation and traffic.	Same as proposed project
Transportation & Traffic Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional daily trips during construction and operation may be needed)	Less than significant (less than the proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)

Summary Chapter 6 - References
This chapter contains a list of the references and the organizations and persons consulted for the preparation of this PEA.

Summary Chapter 7 - Acronyms
This chapter contains a list of the acronyms that were used throughout the PEA and the corresponding definitions.

Appendix A - Proposed Amended Rule 2002 - Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx)
This appendix contains the proposed amended rule language for PAR 2002.

Appendix B - Proposed Amended Rule 2005 - New Source Review For RECLAIM
This appendix contains the proposed amended rule language for PAR 2005.

Appendix C - Proposed Amended Rule 2011 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Sulfur (SOx) Emissions (Attachment C – Quality Assurance and Quality Control Procedures)
This appendix contains the proposed amended protocol language for Rule 2011.

Appendix D - Proposed Amended Rule 2012 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Nitrogen (NOx) Emissions (Attachment C – Quality Assurance and Quality Control Procedures)
This appendix contains the proposed amended protocol language for Rule 2012.

Appendix E - Construction and Operation Calculations
This appendix contains the assumption and calculations for construction and operation activities associated with the proposed project.

Appendix F - Notice of Preparation/Initial Study (NOP/IS) (Environmental Checklist)
This appendix contains the NOP/IS that was released for public review and comment from December 5, 2014 to January 30, 2015.

Appendix G - Comment Letters Received on the NOP/IS and Responses to the Comments
This appendix contains the comment letters received relative to the NOP/IS and the responses to individual comments.

Appendix H – CEQA Scoping Meeting Comments and Responses to the Comments
This appendix contains a summary of the CEQA-related comments made at the CEQA Scoping Meeting held on January 8, 2015 and the responses to individual comments.

CHAPTER 2

PROJECT DESCRIPTION

2.0 PROJECT LOCATION

The proposed amendments to Regulation XX would apply to equipment and processes operated at NOx RECLAIM facilities located throughout the entire SCAQMD jurisdiction. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Basin) (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). The Basin, which is a subarea 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 non-desert 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 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 (see Figure 2-1).

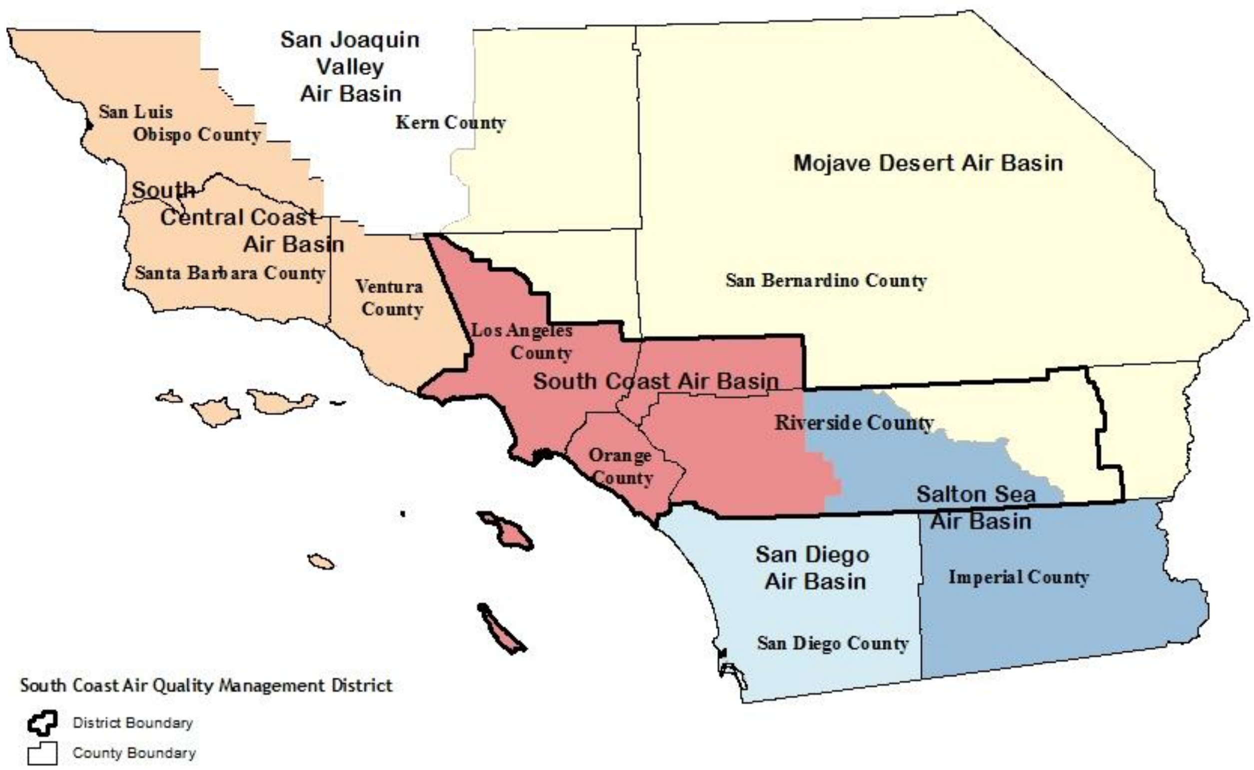

Figure 2-1: Southern California Air Basins

2.1 PROJECT BACKGROUND

On October 15, 1993, the SCAQMD Governing Board adopted Regulation XX, referred to herein as the RECLAIM program. Regulation XX is comprised of 15 rules which contain a declining market-based cap and trade mechanism to reduce NOx and SOx emissions from the largest stationary sources in the Basin and subsequently help meet air quality standards while providing facilities with the flexibility to seek the most cost-effective solution for achieving the required reductions. Instead of setting specific limits on each piece of equipment and each process that contributes to air pollution as is stipulated by traditional 'command-and-control' regulations, under the RECLAIM program each facility has a NOx and/or SOx annual emissions limit (allocation) and facility operators can decide what equipment, processes and materials they will use to reduce emissions to meet or go further below their annual emission limits. In lieu of reducing emissions, facility owners or operators may elect to use the trading market to purchase RTCs from other facilities that have reduced emissions below their annual target.

The portion of Regulation XX that focuses on reducing NOx emissions is referred to as "NOx RECLAIM" while the portion that focuses on reducing SOx emissions is referred to as "SOx RECLAIM." Regulation XX contains applicability requirements, NOx and SOx facility allocations, general requirements, as well as monitoring, reporting, and recordkeeping requirements for NOx and SOx sources located at RECLAIM facilities. The RECLAIM program started with 41 SOx facilities and 392 NOx facilities, but by the end of the 2005 compliance year, the program was populated with 33 SOx facilities and 304 NOx facilities. The population at the end of compliance year 2011 consists of 33 SOx facilities and 276 NOx facilities. The reduction in the number of facilities participating in the RECLAIM program since inception has been primarily due to facility shutdowns and/or consolidations. By the end of compliance year 2013, there were 275 facilities in the NOx RECLAIM universe.

Under the NOx RECLAIM program, the RECLAIM facilities were first issued annual allocations of NOx emissions (also known as facility caps) in 1993 and the facility cap reflected BARCT in effect at that time. RECLAIM facilities have the flexibility to install air pollution control equipment, change their operations, or purchase RECLAIM Trading Credits (RTCs). The NOx RECLAIM facilities are required to reconcile the actual facility emissions with the annual allocations. The annual allocations were designed to decline annually from 1993 until 2003 and remained constant after 2003, when the SCAQMD conducted a BARCT reassessment for NOx in 2005 and another for SOx in 2010, and subsequently reduced the facility annual allocations further.

To assure a more liquid market, as well as protect RECLAIM participants from price fluctuations that may be caused if all the RTCs expire at the same time, two trading cycles were established. Further, to balance emissions among the participating facilities in the RECLAIM program, the affected facilities were randomly divided into two cycles which vary by compliance year. That is, the Cycle 1 compliance year spans from January 1 to December 31 while the Cycle 2 compliance year spans from July 1 to June 30. A backstop level of $15,000 per ton was established to trigger program reevaluation.

Between compliance year 1994 and compliance year 1999, NOx emissions at RECLAIM facilities, in aggregate, were below the annual allocations, and the price of NOx RTCs remained relatively stable, ranging from $1,500 to $3,000 per ton. However, beginning June 2000, RECLAIM program participants experienced a sharp and sudden increase in NOx RTC prices for both 1999 and 2000 compliance years. This was mainly due to an increased demand for power generation due to the California energy situation and the delay of installing NOx control equipment by many power plant operators, which resulted in the power-generating industry purchasing a large quantity of RTCs and depleting the supply of available RTCs. The average price of NOx RTCs for compliance year 2000, traded in the year 2000 increased sharply to over $45,000 per ton compared to the average price of $4,284 per ton traded in 1999. Since the RTC price for NOx exceeded the backstop price of $15,000 per ton, an evaluation of the RECLAIM program was triggered.

The Governing Board, at its October 2000 meeting, directed staff to examine the issues affecting the high price of NOx RTCs and recommend actions to stabilize NOx RTC prices. Additionally, the Governing Board directed the Executive Officer to form an Advisory Committee to provide input to staff regarding possible approaches to stabilize NOx RTC prices. Fourteen power producing facilities, each with a generating capacity of 50 megawatts (MW) or greater, purchased 67 percent of the NOx RTCs that were traded during compliance year 2000, suggesting that the increased demand and high prices of NOx RTCs were primarily due to the power producers. However, the annual allocations for all the power producers only accounted for approximately 14 percent of total RECLAIM annual allocations for compliance year 2000. At the same time, the RECLAIM program reached the 'cross-over point' where emissions equal allocations because many RECLAIM facilities, relying on previously low RTC prices, did not determine that it was more cost-effective to begin installing controls until after the RTC prices had peaked.

In recognition of the inherent lag time between the ability of facility operators to actually install and operate new control equipment, the Governing Board concluded that immediate changes to the RECLAIM program were necessary and, at the January 19, 2001 Board Meeting, directed staff to form a working group to develop and propose amendments to the RECLAIM program. The goal of the proposed amendments was to implement realistic, effective solutions to reduce and stabilize the prices of NOx RTCs. In May 2001, Regulation XX was amended to place trading restrictions on power producing facilities with the caveat that they could fully rejoin the trading market in the 2004 compliance year, provided that the Governing Board determined prior to July 2003 that their re-entry would not result in any negative effect on the remainder of the RECLAIM facilities or on California's energy security needs. In addition, the amendments also required the power plants to install BARCT and introduced credit generating rules. Lastly, a Mitigation Fee Program was established for the power plants to make up excess emissions through an option to pay a fee used by the SCAQMD to mitigate emissions through alternative means or programs.

Pursuant to these requirements, SCAQMD staff examined the energy security needs of California and the potential impacts on the RECLAIM market. The Governing Board determined that reentry of the power plants would not be expected to have a negative effect on California's energy security needs or on other RECLAIM facilities. Overall, power plants equipped with BARCT have reduced their NOx emission rates by approximately 80 percent or more from previously uncontrolled levels.

Based on these emission levels, the 14 power producing facilities are anticipated to emit a total of 1,395 tons per year of NOx and their total annual allocations are 1,705 tons per year for each year from 2003 to 2010. Further, the RTC holdings for the compliance years 2003 through 2010 range from 1,550 to 2,330 tons per year of NOx. This represented a surplus in the NOx RTC holdings at the time ranging from 155 to 935 tons per year. When considering the data relative to the typical annual operational capacity of a power producing unit at below 30 percent, except for 2001 when in-Basin units operated at 35 percent capacity, on average it would take all units operating at a capacity of 55 percent to cause a shortage in NOx RTCs. Therefore, based on the projected excess RTCs and typical operating capacities, power producers were then considered likely to be sellers of NOx RTCs in the RECLAIM program. For these reasons, the Governing Board at the June 6, 2003 public hearing, made the finding that lifting the trading restrictions for power producers in the RECLAIM trading market would not have a negative effect on the remainder of the RECLAIM facilities or on California's energy security needs. Subsequently, the Governing Board adopted proposed changes to RECLAIM Rules 2007, 2011, and 2012 at the December 5, 2003 public hearing which removed most of the trading restrictions on power producers. As a result, effective September 2004, the power producers were given unrestricted use of RTCs.

On January 7, 2005, amendments were made to the NOx RECLAIM program that resulted in a reduction of RTCs across the board by 7.7 tons per day, based on a BARCT evaluation. The RTCs were reduced from compliance years 2007 to 2011. The total RTCs in the NOx RECLAIM universe allocated in compliance year 2011 amounted to 26.5 tons per day. The audited emissions in compliance year 2011 were 20.01 tons per day, equating to 6.49 tons per day of excess holdings.

In accordance with the Health and Safety Code (HSC) §§40440 and 39616, an additional BARCT assessment of the NOx RECLAIM program is once again required to: 1) assess the advancement in control technology; 2) to ensure that RECLAIM facilities achieve the same emission reductions that would have occurred under a command-and-control approach; 3) to ensure that emission reductions from the NOx RECLAIM program contribute towards achieving the federal National Ambient Air Quality Standards (NAAQS); and, 4) to assure that the participating facilities will continue to achieve emission reductions as expeditiously as possible to carry out the commitments in the 2012 AQMP. Except for power producing facilities, the proposed RTC shave reduction will be based on compliance year 2011 activity levels for all other affected facilities. The 2012 activity levels will be used for RTC reductions from power producing facilities because this activity level better represents this sector's energy consumption.

2.2 PROJECT OBJECTIVES

CEQA Guidelines §15124 (b) requires a statement of objectives to describe the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in developing a reasonable range of alternatives to evaluate in the EIR (or equivalent CEQA document) and to aid the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed project are to:

1) Comply with the requirements in Health and Safety Code (HSC) §§40440 and 39616 by conducting a BARCT assessment of the NOx RECLAIM program and reducing the amount of available NOx RTCs to reflect emission reductions equivalent to implementing available BARCT;
2) Modify the RTC "shaving" methodology to implement the emission reductions per the BARCT assessment;
3) Ensure that RECLAIM facilities, in aggregate, achieve the same emission reductions that would have occurred under a command-and-control approach;
4) Achieve the proposed NOx emission reduction commitments in the 2012 AQMP Control Measure #CMB-01: Further NOx Reductions from RECLAIM; and,
5) Achieve NOx emission reductions to assist in attaining the NAAQS.

2.3 PROJECT DESCRIPTION

To comply with the requirements in HSC §§40440 and 39616, SCAQMD staff conducted a BARCT assessment of the NOx RECLAIM program which resulted in adjusting BARCT levels for both equipment and source categories in the refinery and non-refinery sectors. For the refinery sector, a new level of BARCT is proposed for FCCUs, refinery boilers/heaters rated great than 40 mmBTU/hr, refinery gas turbines, coke calciners, and SRU/TGUs. For the non-refinery sector, a new BARCT level is proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal heat treating furnaces rated great than 150 mmBTU/hr, gas turbines and ICEs not located on the outer continental shelf (OCS). No new BARCT is proposed for power plants. Tables 2-1 and 2-2 summarize the proposed 2015 BARCT levels for the refinery and non-refinery sectors, respectively, along with the associated projected NOx emission reductions.

Table 2-1
Proposed 2015 BARCT Levels and Projected NOx Emission Reductions for Refinery Sector

Refinery Sector Equipment/Source Category	Proposed 2015 BARCT Level	Projected NOx Emission Reductions (tpd)
FCCUs	2 ppmv at 3% O2	0.43
Refinery Boilers and Heaters rated at >40 mmBTU/hr	2 ppmv or 0.002 lb/mmbtu	0.96
Refinery Gas Turbines	2 ppm at 15% O2	4.14
Coke Calciner	10 ppmv at 3% O2	0.17
SRU/TGUs	2 ppmv at 3% O2 or 95% reduction	0.32
	TOTAL	**6.02**

Note: tpd = tons per day

Table 2-2
Proposed 2015 BARCT Levels and Projected NOx Emission Reductions for Non-Refinery Sector

Non-Refinery Sector Equipment/Source Category	Proposed 2015 BARCT Level	Projected NOx Emission Reductions (tpd)
Container Glass Melting Furnaces	80% reduction	0.24
Sodium Silicate Furnace	80% reduction	0.09
Metal Heat Treating Furnaces >150 mmbtu/hr	9 ppmv at 3% O2	0.56
Gas Turbines (non-OCS)	2 ppmv at 15% O2	1.04
Internal Combustion Engines (non-OCS)	11 ppmv at 15% O2	0.84
Cement Kilns	0.5 lbs/ton	1.29*
	Total	**2.77**

Note: tpd = tons per day

* The 1.29 tpd of projected NOx emission reductions from cement kilns were not included in the total of 2.77 tpd projected NOx emission reductions for the non-refinery sector because the cement kilns that were originally operated at CPCC that would otherwise be subject to a BARCT reassessment were not in operation in 2011. However, because the cement kilns were the top source of NOx emissions in 2008, SCAQMD staff conducted a BARCT analysis for cement kilns and reduced the remaining emissions projected to the 2023 level for the cement facility to the BARCT level.

The total combined BARCT-equivalent emission reductions from the refinery and non-refinery sectors are 8.79 tpd (6.02 tpd for the refinery sector plus 2.77 tpd for the non-refinery sector.) To account for projected growth[1] amongst the sectors, the remaining emissions in 2023 at these proposed 2015 BARCT levels would be 10.18 tpd (2.71 tpd for the refinery sector plus 7.47 tpd for the non-refinery sector). In addition, a 10 percent compliance margin has been added to the remaining emissions to account for uncertainties that arose in the BARCT analysis and to account for facilities that have shut down operations. Finally, an adjustment account to hold RTCs for power plants to meet their NSR holding obligations is also proposed. Currently, there are 26.5 tpd of NOx RTC holdings. Overall, a total of 14 tpd of NOx RTC reductions from the current RTC holdings of 26.5 tpd is proposed[2]. To help the Basin achieve the PM2.5 standard by 2024 and the ozone standard by 2032, 14 tpd of NOx RTC reductions are proposed to be implemented over a seven-year period from 2016 to 2022.

For the 275 facilities that are in the NOx RECLAIM program, the 14 tpd of NOx RTC reductions will only affect 65 facilities plus the investors that, together, hold 90 percent of the NOx RTC holdings. Investors are included in the refinery sector and treated as one facility. For the remaining 210 facilities that hold 10 percent of the 26.5 tpd of the NOx RTCs, no NOx RTC shave is proposed because no new BARCT (not cost effective and/or infeasible) was identified for the types of equipment and source categories at these facilities. By following this approach, the shave is distributed as follows:

- 67% shave for 9 refineries and investors (treated as one facility)
- 47% shave for 30 power plants
- 47% shave for 26 non-major facilities
- 0% shave for 210 remaining facilities

In addition, the overall NOx RTC reductions of 14 tpd is expected to be achieved incrementally from 2016 to 2022, according to the following implementation schedule:

- 2016 – 4 tons per day
- 2018 – 2 tons per day
- 2019 – 2 tons per day
- 2020 – 2 tons per day
- 2021 – 2 tons per day
- 2022 – 2 tons per day

In particular, the proposed project is estimated to reduce four tons per day of NOx emissions starting in 2016 because the amount of unused RTCs in the NOX RECLAIM program over the past five years (e.g., from 2009 to 2013) ranged from five tpd to eight tpd, demonstrating that there is enough cushion to support reduction of four tpd in 2016. However, because it could take from two to four years for the affected facilities to plan, obtain permits, and install air pollution control equipment or modify existing equipment in response to the proposed project, the

[1] The growth factor assumptions are: 1) 1.0 for the refinery sector; 2) 0.89 for power plants; and 3) 1.1 for the non-refinery sector.

[2] RTC Reductions = RTC Holdings – Remaining Emissions in 2023 - Adjustments = 14 tpd

remaining shave of 10 tpd is scheduled to take place over the five-year period from 2018 to 2022.

To incorporate the proposed NOx RTC shave and implementation schedule, amendments to the NOx RECLAIM regulation are proposed to establish procedures and criteria for reducing NOx RECLAIM RTCs and NOx RTC adjustment factors for year 2016. The proposed amendments contain the following key elements:

- Amend Rule 2002 - Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), to establish procedures and criteria for reducing NOx RTCs and NOx RTC adjustment factors for year 2016 and later.
- Amend Rule 2002 to add new BARCT emission factors ending in 2021 for an assortment of equipment/process categories.
- Amend Rule 2002 to allow new power producers: 1) use of the Adjustment Account for their New Source Review holding requirement; and, 2) access to this account during a Governor's declared state of emergency.
- Amend Rule 2005 to establish an Adjustment Account for power plant New Source Review holding requirements and set criteria for use of those RTCs in the event the Governor declares a state of emergency for power generation.
- Amend Rule 2011 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Sulfur (SOx) Emissions (Attachment C – Quality Assurance and Quality Control Procedures)
- Amend Rule 2012 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Nitrogen (NOx) Emissions (Attachment C – Quality Assurance and Quality Control Procedures)
- Make administrative and other minor changes such as correcting typographical errors as well as clarifying and updating the rule and rule protocol language for consistency.

Other minor changes are proposed for clarity and consistency throughout the proposed amended regulation. A copy of PARs 2002 and 2005 can be found in Appendices A and B, respectively of this Draft PEA. A copy of the proposed amended protocols for Rules 2011 and 2012 can be found in Appendices C and D, respectively.

The following is a more detailed summary of the key proposed amendments to the affected rules and protocols that comprise Regulation XX.

PAR 2002

<u>RECLAIM Allocations – subdivision (b)</u>

- Clarify in new paragraph (b)(5) that emission data submitted pursuant to Rule 301 paragraph (l)(10) shall not be considered in determining facility Allocation if new or amended data is submitted more than five years after the original due date.

<u>Annual Allocations for NOx and SOX and Adjustments to RTC Holdings – subdivision (f)</u>

- Change compliance year "2011 and after" to "2011 to 2015" for the existing NOx RTC adjustment factors in subparagraph (f)(1)(A).

- Add new RTC adjustment factors to subparagraphs (f)(1)(B) and (f)(1)(C) for tradable/usable and non-tradable/non-usable NOx RTCs for facilities listed in Tables 7 and 8, respectively, in order to achieve projected NOx emission reductions from NOx RTC holders beginning in compliance year 2016 and later.
- Clarify in new subparagraph (f)(1)(D) that RTCs which are designated as non-tradeable/non-usable shall be held, but not used or traded.
- Clarify procedures for entering the RECLAIM program after January 7, 2005 in subparagraph (f)(1)(K) to reflect the new RTC adjustment factors added to subparagraphs (f)(1)(B) and (f)(1)(C).
- Add new allowance in paragraph (f)(4) for all power producing facilities that have received SCAQMD Permits to Construct on or after October 15, 1993 to have access to an Adjustment Account in order to comply with the new source review holding requirements in subdivision (f) of Rule 2005.
- Add criteria in paragraph (f)(5) for all power producing facilities to have access to an Adjustment Account RTCs during a State of Emergency as declared by the Governor. The amount and distribution of the RTCs will be determined by the SCAQMD's Executive Officer and will take into account the impact that the State of Emergency has on the RECLAIM program.

<u>RTC Reduction Exemption – subdivision (i)</u>

- Clarify paragraph (i)(1) that the RTC reduction exemption does not include RTC holdings for compliance year 2016 and thereafter.
- Clarify subparagraph (i)(1)(B) that the application for an RTC reduction exemption needs to demonstrate that the reported emissions for Compliance Year 2013 are not from equipment listed in existing Table 3 or new Table 6 and that the achieved emission rates are less than the emission factors listed in existing Table 3 or new Table 6, whichever is lower.
- Clarify subparagraphs (i)(1)(C) and (i)(2)(C) that the application for an RTC reduction exemption needs to demonstrate that the RTCs for Compliance Year 2016 have never been transferred or sold by the facility.
- Clarify clause (i)(1)(D)(i) to allow the exclusion of control costs for any equipment listed in existing Table 3 or new Table 6.
- Clarify paragraph (i)(3) that an application for an RTC reduction exemption shall be submitted no later than six months after the adoption of the proposed project.
- Clarify paragraph (i)(8) to require a facility qualifying for an exemption to include emissions from equipment listed in existing Table 3 or new Table 6 in its Annual Permit Emission Program (APEP) report.

<u>RECLAIM NOx 2021 Ending Emission Factors – new Table 6</u>

- Add new BARCT emission factors up to the year 2021 for certain boilers and heaters, cement kilns, FCCUs, gas turbines, container glass melting furnaces, permitted ICEs, metal heat treating furnaces, petroleum coke calciners, sodium silicate furnaces, and SRU/TGUs.

List of NOx RECLAIM Facilities Referenced in Subparagraph (f)(1)(B) – new Table 7

- Add new table which identifies the specific facilities (e.g., major refineries and coke calciner) that will be subject to the NOx RTC holdings adjustment factors in subparagraph (f)(1)(B).

List of NOx RECLAIM Facilities Referenced in Subparagraph (f)(1)(C) – new Table 8

- Add new table which identifies the specific facilities that will be subject to the NOx RTC holdings adjustment factors in subparagraph (f)(1)(C).

PAR 2005

Requirements for New or Relocated RECLAIM Facilities – Subdivision (b)

- Amend subparagraph (b)(2)(A) to clarify the Facility Permit approval criteria in that a facility demonstrating that they hold sufficient RTCs will also need to demonstrate that they hold sufficient RTCs accessed from the Adjustment Account per paragraph (f)(4) of Rule 2002.

Offsets – Subdivision (f)

- Amend paragraphs (f)(2) and (f)(3) by excluding Adjustment Account RTCs from the selling limitations that currently applies to unused RTCs.

Rule 2011 Appendix A (SOx Protocol for Rule 2011)

Attachment C - Quality Assurance and Quality Control Procedures

- Add new procedures and criteria for postponing the due date of semi-annual or annual assessments of a major source.
- Add new procedures and criteria for postponing the due date of semi-annual or annual assessments of an electrical generating facility (EGF).

Rule 2012 Appendix A (NOx Protocol for Rule 2012)

Attachment C - Quality Assurance and Quality Control Procedures

- Add new procedures and criteria for postponing the due date of semi-annual or annual assessments of a major source.
- Add new procedures and criteria for postponing the due date of semi-annual or annual assessments of an electrical generating facility (EGF).

2.4 TECHNOLOGY OVERVIEW

NOx Emission Sources

The NOx RECLAIM program currently consists of 275 facilities as of the 2013 compliance year. SCAQMD staff conducted a BARCT analysis for these 275 facilities. Of these, 30 power producing facilities where shown to operate at current BARCT or BACT levels. For 224 facilities, either no new BARCT was identified or the installation of control equipment was determined to not be cost-effective and/or infeasible. Further, only 44 facilities are expected to comply with the proposed NOx RTC shave through the purchase of RTCs which will have no environmental impact.

SCAQMD staff conducted an analysis of the potential feasibility and cost-effectiveness of adding controls to reduce NOx from the remaining 21 facilities (e.g, 275 – 30 power producers - 224 = 21) which are either major or large sources of NOx for which new BARCT has been identified. Further, 19 of the 21 facilities are also among the top NOx RTC holders.

The BARCT analysis further found that it would be both feasible and cost-effective for facility operators to install new control equipment or modify existing control equipment in response to the proposed NOx RTC shave for facilities which operate with current SCAQMD permits. Of the 21 facilities, 12 facilities belong to the non-refinery sector and 9 facilities belong to the refinery sector. These facilities are identified as follows:

<u>Nine Facilities in the Refinery Sector:</u>

- Six refineries owned by five companies operate FCCUs, refinery boilers and heaters, refinery gas turbines, and SRU/TGUs: Tesoro (two locations: Wilmington and Carson); Phillips 66 (two locations: Wilmington and Carson); Chevron; ExxonMobil; and, Ultramar (also referred to as Valero)
- One sulfur plant: Tesoro (Wilmington location)
- One coke calciner plant: Tesoro (Wilmington location)

Of the above-listed facilities, six refineries operate one FCCU each, one SRU/TGU each, and a multitude of refinery process heaters and boilers and refinery gas turbines. The quantity of major and large source NOx emissions from the refineries comprises approximately 54 percent of the total NOx emitted from the universe of RECLAIM facilities in compliance year 2011.

<u>12 Facilities in the Non-Refinery Sector:</u>

- One container glass manufacturing plant: Owens-Brockway Glass Container Inc.
- One sodium silicate manufacturing plant: PQ Corporation
- One steel plant operating two metal heat treating furnaces rated greater than > 150 million British Thermal Units per hr (mmBTU/hr): California Steel
- Seven facilities operating gas turbines: Southern California Gas Company, SDGE, THUMS Long Beach, Wheelabrator Norwalk Energy, LA City Department of Airports, Tin Inc., and Berry Petroleum
- Three facilities operating IC Engines: SDGE and Southern California Gas Company (two facilities)
- One facility operating Portland cement kilns: CPCC

The major and large sources belonging to non-refineries among the top NOx emitting facilities that were analyzed for BARCT emitted 18 percent of the RECLAIM universe's total emissions inventory in compliance year 2011.

It is important to note that CPCC is no longer operating their Portland cement kilns with current SCAQMD permits. Because CPCC's operators hold NOx RTCs, the BARCT analysis can be applied to this facility by shaving their NOx RTCs holdings. However, because the affected equipment is not operational, the installation of BARCT control equipment would not be expected.

In conclusion, the proposed project may result in the installation of new or the modification of existing NOx emission control equipment for 20 of these industrial equipment and processes (e.g., 9 facilities from the refinery sector and 11 facilities from the non-refinery sector) and Portland cement kilns are excluded from this assumption for reasons that are further explained in the Portland Cement Kiln discussion under the Non-Refinery / Non-Power Plant Category section later in this chapter.

Combustion Equipment

Combustion is a high temperature chemical reaction resulting from burning a gas, liquid, or solid fuel (e.g., natural gas, diesel, fuel oil, gasoline, propane, and coal) in the presence of air (oxygen and nitrogen) to produce: 1) heat energy; and, 2) water vapor or steam. An ideal combustion reaction is when the entire amount of fuel needed is completely combusted in the presence of air so that only carbon dioxide (CO2) and water are produced as by-products. However, since fuel contains other components such as nitrogen and sulfur plus the amount of air mixed with the fuel can vary, in practice, the combustion of fuel is not a "perfect" reaction. As such, uncombusted fuel plus smog-forming by-products such as NOx, SOx, carbon monoxide (CO), and soot (solid carbon) can be discharged into the atmosphere.

Of the total NOx emissions that can be generated, there are two types of NOx formed during combustion: 1) thermal NOx; and, 2) fuel NOx. Thermal NOx is produced from the reaction between the nitrogen and oxygen in the combustion air at high temperatures while fuel NOx is formed from a reaction between the nitrogen already present in the fuel and the available oxygen in the combustion air. As the source of nitrogen in fuel is more prevalent in oil and coal, and is negligible in natural gas, the amount of fuel NOx generated is dependent on fuel type. For example, with oil that contains significant amounts of fuel-bound nitrogen, fuel NOx can account for up to 50 percent of the total NOx emissions generated. In another example, only 10 percent of NOx emissions from FCCUs are thermal NOx while the remaining 90 percent of NOx is generated from fuel by combusting petroleum coke. Though boilers, process heaters, petroleum coke calciners, FCCUs, gas turbines, and other miscellaneous equipment have varying purposes in commercial, industrial, and utility applications, at a minimum, they all generate thermal NOx as a combustion by-product. The following provides a brief description of the various types of existing combustion equipment that may be affected by the proposed amendments to Regulation XX and subsequently retrofitted with NOx control equipment.

REFINERY CATEGORY

Refinery Process Heaters and Boilers

Refinery process heaters and boilers are used extensively throughout various processes in refinery operations such as distillation, hydrotreating, fluid catalytic cracking, alkylation, reforming, and delayed coking.

A process heater is a type of combustion equipment that burns liquid, gaseous, or solid fossil fuel for the purpose of transferring heat from combustion gases to heat water or process streams. Process heaters are not kilns or ovens used for drying, curing, baking, cooking, calcining, or vitrifying; or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.

A typical boiler, also referred to as a steam generator, is a steel or cast-iron pressure vessel equipped with burners that combust liquid, gas, or solid fossil fuel to produce steam or hot water. Boilers are classified according to the amount of energy output in millions of British Thermal Units per hour (mmBTU/hr), the type of fuel burned (natural gas, diesel, fuel oil, etc.), operating steam pressure in pounds per square inch (psi), and heat transfer media. In addition, boilers are further defined by the type of burners used and air pollution control techniques. The burner is where the fuel and combustion air are introduced, mixed, and then combusted.

There are a total of 212 boilers and heaters classified as major and large NOx sources at the refineries (23 boilers and 189 heaters). Collectively, the 212 boilers and heaters emitted approximately 7.39 tons per day in 2011.

Refinery process heaters and boilers are primarily fueled by refinery gas, one of several products generated at the refinery. In addition, most of the refinery process heaters and boilers are designed to also operate on natural gas, but liquid or solid fuels are rarely used. The combustion of fuel generates NOx, primarily "thermal" NOx with small contribution from "fuel" NOx and "prompt" NOx.

For the purpose of the analysis in this PEA, controlling NOx emissions from refinery boilers and process heaters is assumed to be accomplished with selective catalytic reduction (SCR) technology. While low NOx burners may be effective at reducing NOx emissions, SCRs were analyzed because SCR technology has been demonstrated to have more adverse construction and operational impacts than low NOx burners. Thus, by analyzing SCRs in lieu of low NOx burners, the analysis in this PEA applies the most conservative assumptions to represent a "worst-case" scenario. For a full description of this control technology, see the NOx Control Technologies section.

Refinery Gas Turbines

Gas turbines are used in refineries to produce both electricity and steam. Refinery gas turbines are typically combined cycle units that use two work cycles from the same shaft operation. Refinery gas turbines also have an additional element of heat recovery from its exhaust gases to produce more power by way of a steam generator. Gas turbines can operate on both gaseous and liquid fuels. Gaseous fuels include natural gas, process gas, and refinery gas. Liquid fuels typically include diesel. The units in this category are cogenerating units that recover the useful energy from heat recovery for producing process steam. There are a total of 21 gas turbines/duct burners classified as major NOx sources at the refineries in the SCAQMD. Collectively, the 21 gas turbines/duct burners emitted about 1.33 tons per day of NOx in 2011.

Frame gas turbines are exclusively used for power generation and continuous base load operation ranging up to 250 MW with simple-cycle efficiencies of approximately 40 percent and combined-cycle efficiencies of 60 percent. The existing gas turbines operating at the refineries are rated from seven MW to 83 MW. Most of the refinery gas turbines are operated with duct burners, heat recovery steam generator (HRSG), SCR, and CO catalysts. Figure 2-2 shows a typical layout of a combined cycle utility gas turbine with a duct burner, HRSG, and control system.

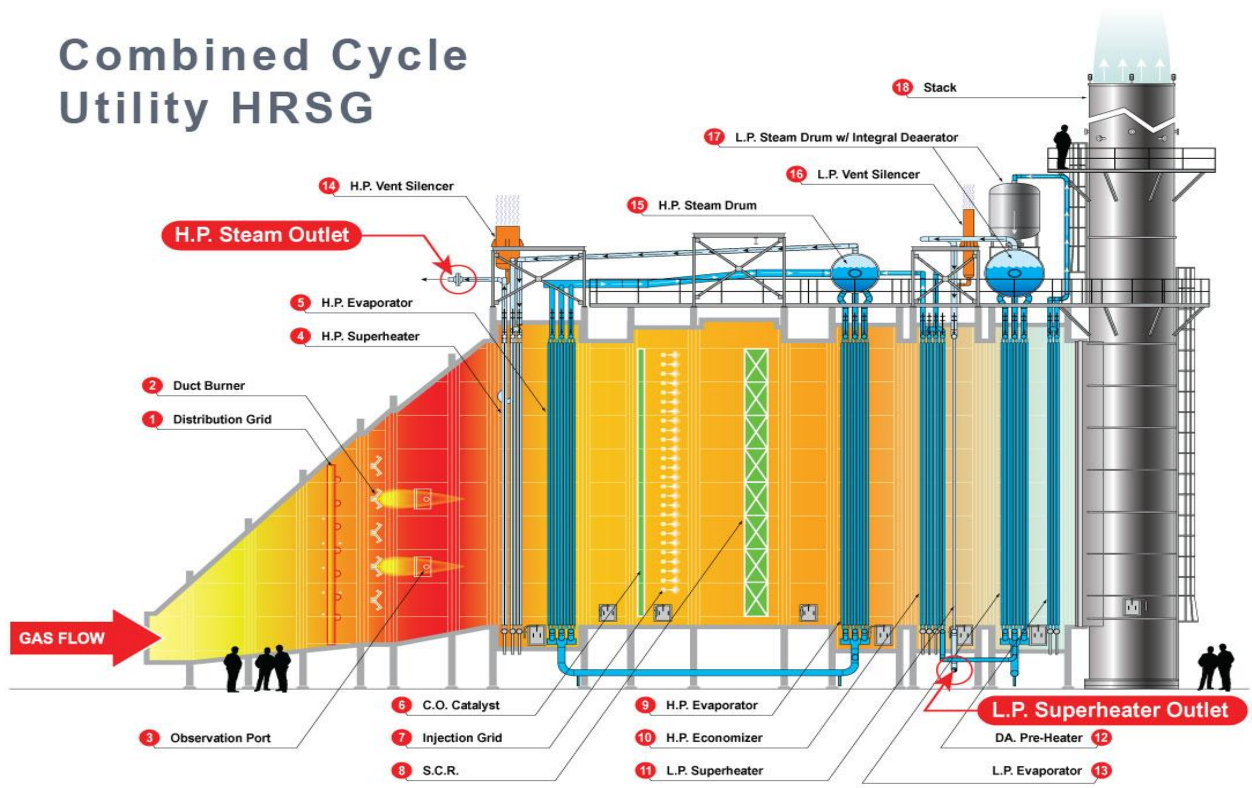

Figure 2-2: Gas Turbine with Duct Burner

For the purpose of the analysis in this PEA, controlling NOx emissions from refinery gas turbines is assumed to be accomplished with SCR technology. For a full description of this control technology, see the NOx Control Technologies section.

Sulfur Recovery Units and Tail Gas Units (SRU/TGUs)

Refinery SRU/TGTUs, including their incinerators, are classified as major sources of both NOx and SOx emissions. Because sulfur is a naturally occurring and undesirable component of crude oil, refineries employ a sulfur recovery system to maximize sulfur removal. A typical sulfur removal or recovery system will include a sulfur recovery unit (e.g., Claus unit) followed by a tail gas treatment unit (e.g., amine treating) for maximum removal of hydrogen sulfide (H_2S). A Claus unit consists of a reactor, catalytic converters and condensers. Two chemical reactions occur in a Claus unit. The first reaction occurs in the reactor, where a portion of H_2S reacts with air to form sulfur dioxide (SO_2) followed by a second reaction in the catalytic converters where SO_2 reacts with H_2S to form liquid elemental sulfur. Side reactions producing carbonyl sulfide

(COS) and carbon disulfide (CS_2) can also occur. These side reactions are problematic for Claus plant operators because COS and CS_2 cannot be easily converted to elemental sulfur and carbon dioxide. Liquid sulfur is recovered after the final condenser. The combination of two converters with two condensers in series will generally remove as much as 95 percent of the sulfur from the incoming acid gas. To increase removal efficiency, some newer sulfur recovery units may be designed with three to four sets of converters and condensers.

To recover the remaining sulfur compounds after the final pass through the last condenser, the gas is sent to a tail gas treatment process such as a SCOT or Wellman-Lord treatment process. For example, the SCOT tail gas treatment is a process where the tail gas is sent to a catalytic reactor and the sulfur compounds in the tail gas are converted to H_2S. The H_2S is absorbed by a solution of amine or diethanol amine (DEA) in the H_2S absorber, steam-stripped from the absorbent solution in the H_2S stripper, concentrated, and recycled to the front end of the sulfur recovery unit. This approach typically increases the overall sulfur recovery efficiency of the Claus unit to 99.8 percent or higher. However, the fresh acid gas feed rate to the sulfur recovery unit is reduced by the amount of recycled stream, which reduces the capacity of the sulfur recovery unit. The residual H_2S in the treated gas from the absorber is typically vented to a thermal oxidizer where it is oxidized to sulfur dioxide (SO_2) before venting to the atmosphere.

The Wellman-Lord tail gas treatment process is when the sulfur compounds in the tail gas are first incinerated to oxidize to SO_2. After the incinerator, the tail gas enters a SO_2 absorber, where the SO_2 is absorbed in a sodium sulfite (Na_2SO_3) solution to form sodium bisulfite ($NaHSO_3$) and sodium pyrosulfate ($Na_2S_2O_5$). The absorbent rich in SO_2 is then stripped, and the SO_2 is recycled back to the beginning of the Claus unit. The residual sulfur compounds in the treated tail gas from the SO_2 absorber is then vented to a thermal (or catalytic) oxidizer (incinerator) where the residual H_2S in the tail gas is oxidized to SO_2 before venting to the atmosphere. NOx is a by-product of operating the incinerator.

The type of NOx control option to be utilized in response to this portion of the proposed project is assumed to be LoTOx^{TM} technology with a WGS. For a full description of this control technology, see the NOx Control Technologies section.

<u>Petroleum Coke Calciner</u>

Petroleum coke, the heaviest portion of crude oil, cannot be recovered in the normal oil refining process. Instead, it is processed in a delayed coker unit to generate a carbonaceous solid referred to as "green coke," a commodity. To improve the quality of the product, if the green coke has a low metals content, it will be sent to a calciner to make calcined petroleum coke. Calcined petroleum coke can be used to make anodes for the aluminum, steel, and titanium smelting industry. If the green coke has a high metals content, it is used as fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

As shown in Figure 2-3, the process of making calcined petroleum coke begins when the green coke feed produced by the delayed coker unit is screened and transported to the calciner unit where it is stored in a covered coke storage barn. The screened and dried green coke is introduced into the top end of a rotary kiln and is tumbled by rotation under high temperatures that range between 2000 and 2500 degrees Fahrenheit (^oF). The rotary kiln relies on gravity to move coke through the kiln countercurrent to a hot stream of combustion air produced by the combustion of natural gas or fuel oil. As the green coke flows to the bottom of the kiln, it rests in the kiln for approximately one additional hour to eliminate any remaining moisture, impurities, and hydrocarbons. Once discharged from the kiln, the calcined coke is dropped into a cooling chamber, where it is quenched with water, treated with de-dusting agents to minimize dust, carried by conveyors to storage tanks. Eventually, the calcined coke is transported by truck to the Port of Long Beach for export, or is loaded onto railcars for shipping to domestic customers. As the green coke is processed under high heat conditions in the rotary kiln, NOx emissions are generated. NOx is also generated from combusting fuel oil to generate high heating values in the rotary kiln.

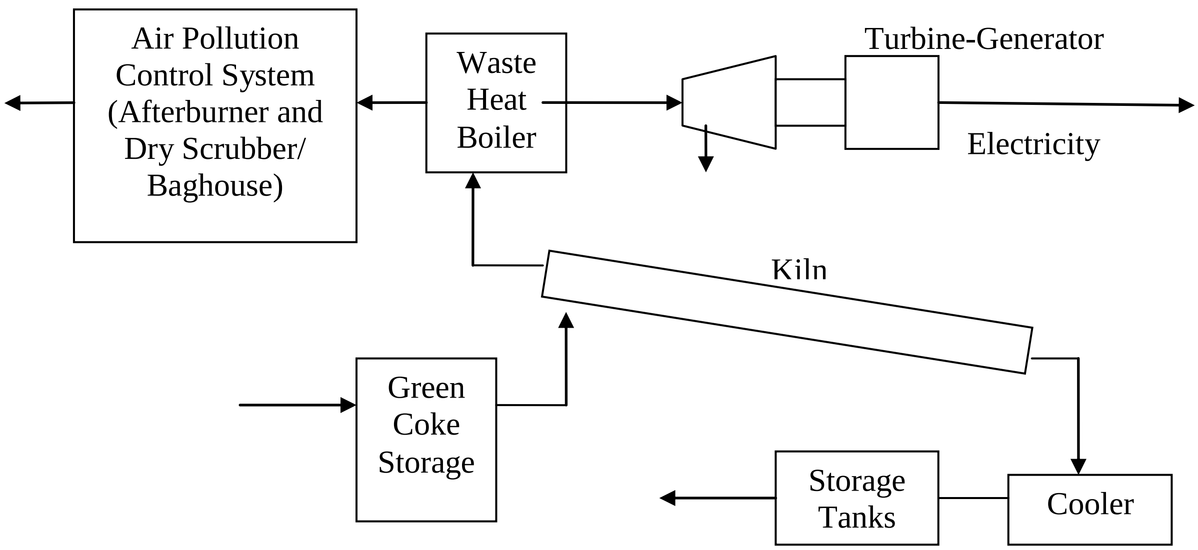

Figure 2-3: Coke Calciner Process

The Tesoro Wilmington coke calciner is the only petroleum coke calciner in the Basin and produces approximately 400,000 short tons per year of calcined products. This petroleum coke calciner is a global supplier of calcined coke to the aluminum industry, and fuel grade coke to the fuel, cement, steel, calciner, and specialty chemicals businesses. The existing control system also includes a spray dryer, a reverse-air baghouse, a slurry storage system, a slurry circulating system, and a pneumatic conveying system. Calcium hydroxide (CaOH) slurry is the absorbing medium for SO_2 control.

There are two commercially available multi-pollutant control technologies for the low temperature removal of NOx emissions from the coke calciner: 1) LoTOx™ with scrubber; and, 2) UltraCat. For a full description of these control technologies, see the NOx Control Technologies section. The type of NOx control option to be utilized for the coke calciner in response to the proposed project will depend on this facility's individual operations and the current control technologies and techniques in place. Thus, the Draft PEA will evaluate the possibility that operators of the petroleum coke calcining facility may rely on either of the above-mentioned control technologies to further control NOx emissions in order to comply with the BARCT requirements for the petroleum coke calcining portion of the proposed project. For a full description of these control technologies, see the NOx Control Technologies section.

<u>FCCUs</u>

The purpose of an FCCU at a refinery is to convert or "crack" heavy oils (hydrocarbons), with the assistance of a catalyst, into gasoline and lighter petroleum products. Each FCCU consists of three main components: a reaction chamber, a catalyst regenerator and a fractionator. All six refineries each operate one FCCU.

As shown in Figure 2-4, the cracking process begins in the reaction chamber where fresh catalyst is mixed with pre-heated heavy oils (crude) known as the fresh feed. The catalyst typically used for cracking is a fine powder made up of tiny particles with surfaces covered by several microscopic pores. A high heat-generating chemical reaction occurs that converts the heavy oil liquid into a cracked hydrocarbon vapor mixed with catalyst. As the cracking reaction progresses, the cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into lighter hydrocarbon components than crude such as light gases, gasoline, light gas oil, and cycle oil.

Towards the end of the reaction, the catalyst surface becomes inactive or spent because the pores are gradually coated with a combination of heavy oil liquid residue and solid carbon (coke), thereby reducing its efficiency or ability to react with fresh heavy liquid oil in the feed. To prepare the spent catalyst for re-use, the remaining oil residue is removed by steam stripping. The spent catalyst is later cycled to the second component of the FCCU, the regenerator, where hot air burns the coke layer off of the surface of each catalyst particle to produce reactivated or regenerated catalyst. Subsequently, the regenerated catalyst is cycled back to the reaction chamber and mixed with more fresh heavy liquid oil feed. Thus, as the heavy oils enter the cracking process through the reaction chamber and exit the fractionator as lighter components, the catalyst continuously circulates between the reaction chamber and the regenerator.

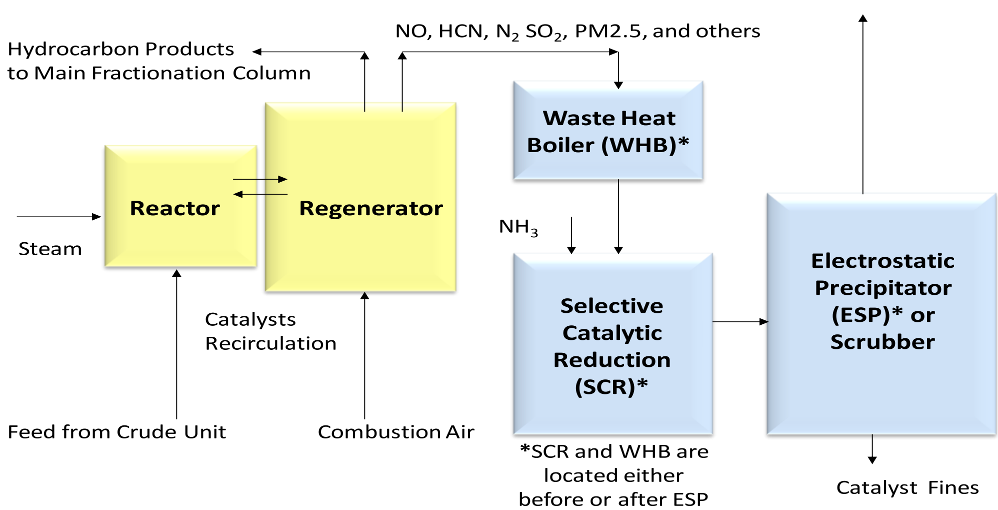

Figure 2-4: Simplified Schematic of FCCU Process

During the regeneration cycle, large quantities of catalyst are lost in the form of catalyst fines or particulates thus making FCCUs a major source of primary particulate emissions (PM10 and PM2.5) at refineries. In addition, particulate (PM) precursor emissions such as SOx (because crude oil naturally contains sulfur) and NOx, additional secondary particulates (i.e., formed as a result of various chemical reactions), plus carbon monoxide (CO) and carbon dioxide (CO_2) are produced due to coke burn-off during the regenerator process.

Approximately 90 percent of the NOx generated from the FCCUs is from the nitrogen in the feed that is accumulated in the coke which is then burned-off in the regenerator. This portion of the

NOx is called "fuel" NOx. "Fuel" NOx is a combination of nitric oxide (NO), nitrogen dioxide (NO_2), and nitrous oxide (N_2O). The remaining 10 percent of the NOx generated from the FCCUs are "thermal" NOx which is generated in the high temperature zones in the regenerator, and "prompt" NOx generated from the reaction between nitrogen and oxygen in the combustion air.

Combustion in a FCCU regenerator generates various pollutants (e.g., NO, N_2O, NO_2, HCN, NH_3, SO_2, etc.) and their dynamic interaction with each other is complex. "Fuel" nitrogen in the coke is first converted to HCN. HCN is thermodynamically unstable and it is converted to NH_3, N_2, NO, N2O, and NO_2. The rates of these reactions depend heavily on the FCCU regenerator temperatures and configuration.

Currently, refineries may operate FCCUs by utilizing NOx reducing additives to promote the conversion of NOx, HCN, and NH_3 to elemental nitrogen (N_2) and reduce NOx emissions. The removal efficiency for NOx reducing additives can range between 50 percent and 80 percent. A simplified version of the chemical reactions in the FCCU regenerator is shown in Figure 2-5.

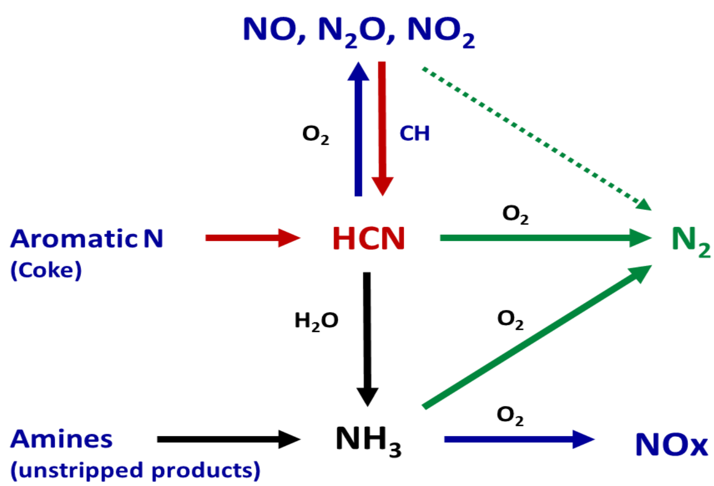

Figure 2-5: Nitrogen Chemistry in the FCCU Regenerator

When using NOx reducing additives, manufacturers recommend the following best practices to minimize the formation of NOx and simultaneously promote the conversion of CO to CO_2: 1) minimize excess oxygen since higher amounts of excess oxygen favors the undesirable formation of NOx rather than N_2; 2) reduce nitrogen in the feed stream; and, 3) utilize non-platinum CO promoters.

To further reduce NOx emissions from a FCCU (beyond what is currently being achieved through the use of NOx reducing additives, the potential available control technologies are either: 1) SCR; or, 2) LoTOx™ with WGS. For a full description of these control technologies, see the NOx Control Technologies section.

NON-REFINERY / NON-POWER PLANT CATEGORY

Portland Cement Kilns

In the NOx RECLAIM program, there is one facility (CPCC) with two cement kilns capable of producing gray cement from limestone, sand, shale, and clay raw materials. The CPCC facility, under normal operation, has typically been among the highest NOx emitters in the RECLAIM program. The manufacturing of gray Portland cement follows a four-step process of: 1) acquiring raw materials; 2) preparing the raw materials to be blended into a raw mix; 3) pyroprocessing of the raw mix to make clinker; and, 4) grinding and milling clinker into cement. The raw materials used for manufacturing cement include calcium, silica, alumina and iron, with calcium having the highest concentration. These raw materials are obtained from a limestone quarry for calcium, sand for silica; and shale and clay for alumina and silica.

The raw materials are crushed, milled, blended into a raw mix and stored. Primary, secondary and tertiary crushers are used to crush the raw materials until they are about ¾-inch or smaller in size. Raw materials are then conveyed to rock storage silos. Belt conveyors are typically used for this transport. Roller mills or ball mills are used to blend and pulverize raw materials into fine powder. Pneumatic conveyors are typically used to transport the fine raw mix to be stored in silos until it is ready to be pyroprocessed.

The pyroprocess in a kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in a kiln, the drying and pre-heating zone, operates at a temperature between 70 ^{o}F and 1650 ^{o}F and evaporates any remaining water in the raw mix of materials entering the kiln. Essentially this is the warm-up phase which stabilizes the temperature of the refractory fire brick inside the mouth opening of the kiln. The second phase, the calcining zone, operates at a temperature between 1100 ^{o}F and 1650 ^{o}F and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases carbon dioxide. During the third phase, the burning zone operates on average at 2200 ^{o}F to 2700 ^{o}F (though the flame temperature can exceed 3400 ^{o}F) during which several reactions and side reactions occur. The first reaction is calcium oxide (produced during the calcining zone) with silicate to form dicalcium silicate and the second reaction is the melting of calcium oxide with alumina and iron oxide to form the liquid phase of the materials. Despite the high temperatures, the constituents of the kiln feed do not combust during pyroprocessing. As the materials move towards the discharge end of the kiln, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. Any excess calcium oxide reacts with dicalcium silicate to form tricalcium silicate. The red hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage for protection from moisture. Since clinker is water reactive, if it gets wet, it will set into concrete.

Heat needed to operate CPCC's kilns is supplied through the combustion of different fuels such as coal, coke, oil, natural gas, and discarded automobile tires. The combustion gases are vented to a baghouse for dust control, and the collected dust is returned to the process or recycled if they meet certain criteria, or is discarded to landfills. CPCC does not currently have any post-combustion control for NOx emissions.

NOx emissions from the cement kilns are generated from the following: 1) combusting fuel to generate high heating values in the kilns; and, 2) oxidation of raw materials entering the cement kiln. As is the case with CPCC, long, dry cement kilns have achieved NOx reductions to the 2000 (Tier 1) level by utilizing low NOx burners and mid-kiln firing with tire-derived fuel (TDF). With TDF, whole tires are introduced at an inlet location about midway along the kiln's calcining zone. TDF lowers NOx emissions by lowering the flame temperatures and reducing thermal NOx with the introduction of a slower burning fuel.

On November 20, 2009, CPCC operators announced the shutdown of both cement kilns indicating at that time that the shutdown would not be permanent to the extent that when the economy improves, they plan to bring the cement kilns back on-line. At the time the NOP/IS was released for public review and comment, the NOP/IS acknowledged that in the event that CPCC operators decide to fire up its kilns, the type of NOx control technology to be utilized to comply with the proposed project will depend on CPCC's individual operations and how the kilns will function with the current control technologies and techniques in place at CPCC (e.g., the baghouse). The potential available control technologies to reduce NOx emissions from cement kilns were described in the NOP/IS as the following: 1) SCR with or without a WGS; 2) UltraCat; or, 3) SNCR. The NOP/IS committed that the Draft PEA would evaluate the possibility that CPCC operators may rely on the above-mentioned control technologies to further control NOx emissions from cement kilns to comply with the proposed project.

However, on April 9, 2015, after the release of the NOP/IS for public review and comment, CPCC operators have surrendered their operating permits for the cement kilns and have applied for Emission Reduction Credits (ERCs). Thus, because CPCC operators are no longer operating the cement kilns and they no longer hold current SCAQMD operating permits for these units, the existing setting or NOx emissions baseline for the cement kilns at CPCC is zero. Further, if CPCC operators decide to restart the cement kilns in the future, applications for new SCAQMD permits to operate would be required. Further, these permit applications would be subject to an extensive permit review process such that that the cement kilns would be treated as a new installation that would be subject to a new CEQA review and BACT requirements, instead of BARCT. Because of CPCC's current permitting status for these cement kilns, CPCC operators will not be able to retrofit the cement kilns with air pollution control equipment in response to the proposed project without first dealing with the permitting issues for the cement kilns. Thus, the installation of control technology and the secondary adverse environmental impacts that may be associated with such control technology is not a reasonably foreseeable consequence for CPCC under the present circumstances.

When evaluating the significance of the environmental effects of a project, the Lead Agency is required to consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused by the project [CEQA Guidelines §15064 (d)]. Because the installation of control technology and the adverse environmental impacts that may be associated with such control technology for the CPCC facility are not reasonably foreseeable and because there are no other Portland cement kilns operating within the SCAQMD's jurisdiction, the SCAQMD, as Lead Agency for the proposed project, is not required to consider or analyze the effects of control technology for this facility. Thus, this PEA does not contain an environmental analysis of the control technologies that were originally contemplated in the NOP/IS for the CPCC facility.

<u>Container Glass Melting Furnaces</u>

In the NOx RECLAIM program there is one facility among the top NOx emitting facilities that operates glass melting furnaces. This facility produces container glass from dry, solid raw materials that are melted in the furnaces and then formed into glass container bottles.

A container glass melting furnace is the main equipment used for manufacturing glass products, such as bottles, glass wares, pressed and blown glass, tempered glass, and safety glass. The manufacturing process consists of four phases: 1) preparing the raw materials; 2) melting the mixture of raw materials in the furnace; 3) forming the desired shape; and, 4) finishing the final product. Raw materials, such as sand, limestone, and soda ash, are crushed and mixed with cullets (recycled glass pieces) to ensure homogeneous melting. The raw materials mixture is then conveyed to a continuous regenerative side-port melting furnace. As the mixture enters the furnace through a feeder, it melts and blends with the molten glass already in the furnace, and eventually flows to a refiner section, to a forming machine, and then, to annealing ovens. The final products undergo inspection, testing, packaging and storage. Any damaged or undesirable glass is transferred back to be recycled as cullet suitable for remelting.

NOx is generated from a container glass melting furnace in two ways: 1) during the decomposition of the silica in the raw materials; and, 2) from combusting fuel to generate high heating values in the furnace. The container glass melting furnace contributes over 99 percent of the total NOx emissions from a glass manufacturing plant. To effectively achieve the largest reduction of NOx emissions, SCR and UltraCat technologies are commercially available options for treating the flue gas of glass melting furnaces. For a full description of these control technologies, see the NOx Control Technologies section.

Sodium Silicate Furnace

In the NOx RECLAIM program, there is only one facility that produces sodium silicate in a melting furnace. Sodium silicate, a type of glass with a wide variety of industrial uses, should not to be confused with container or flat glass. Sodium silicate exists in a solid or liquid form, depending on the temperature. The combination of heating a batch-fed mixture of soda ash and sand causes the materials to produce sodium silicate and CO_2. NOx emissions are also created from combusting fuel needed to heat the furnace. In order to generate high heating values, the furnace is fired by several natural gas-fired burners. The flue gas then exits the furnace via a stack into the atmosphere.

Approximately 15 to 20 percent of NOx emission reductions can be achieved by utilizing blower air staging to lower the flue gas temperature in the furnace. To effectively achieve the largest reduction of NOx emissions, however, SCR technology is best suited for treating the flue gas of sodium silicate furnaces.

In addition, UltraCat, an alternate to SCR technology, is also available for multi-pollutant control. For a full description of these control technologies, see the NOx Control Technologies section.

Metal Heat Treating Furnaces

A metal heat treating furnace burns liquid or gaseous fuel to generate enough pre-heated air at a temperature high enough to melt solid metal and into a liquid molten consistency and to maintain the metal in a liquid state until it is ready for later use. The types of furnaces that are used for metal heat treating are reverberatory, cupola, induction, direct arc furnaces, sweat furnaces, and refining kettles. The burner flame and combustion products come in direct contact with the metal.

Heat treating operations are directly related to the metal producing and secondary metal processing industries. Materials handled by the heat treating industry are a variety of products provided by manufacturers that are used by other manufacturers, to make consumable or usable products. Typical materials used for heat treating are iron, steel, ferro-alloys, glass, and other nonferrous metals. Heat treatment furnaces are used for activities that include forging, hardening, tempering, annealing, normalizing, sintering, and case hardening of steels and solution and heat treatment of corrosion resistant and aluminum metals. Kilns are not considered heat treating furnaces. Among the top NOx emitting facilities in the NOx RECLAIM program, there is only one facility that processes steel in two metal heat treating furnaces with individual heat ratings above 150 mm BTU/hr.

As with all combustion sources, the type of burner used can affect the emissions. Some burners are lower NOx emitting than others. But for these types of furnaces, there are often dozens of burners that cumulatively require a high heat input. To achieve higher efficiency and to consume less fuel, recuperative and regenerative burners are used. These burners employ the principle of using preheated inlet air which is heated by the exhaust gases for more efficient combustion. However, to effectively achieve a substantial NOx reduction from these metal heat treating furnaces, SCR is the technology that is best suited for the flue gas treatment of NOx. For a full description of these control technologies, see the NOx Control Technologies section.

The Draft PEA will evaluate the possibility that the operator of the metal heat treating furnaces may rely on SCR technology to further control NOx emissions in order to comply with the BARCT requirements for the metal heat treating furnace portion of the proposed project. For a full description of this control technology, see the NOx Control Technologies section.

Gas Turbines (Non-Refinery/Non-Power Plant)
Stationary gas turbines are used primarily to drive compressors or to generate power. Gas turbines operate either in simple cycle or combined cycle. Simple cycle units use the mechanical energy of shaft work that is transferred to and used by a gas compressor, for example, or to run an electrical generator to produce electricity. A combined cycle unit adds an additional element of heat recovery from its exhaust gases to produce more power by way of a steam generator. Combined cycle units are more efficient due to their use of two work cycles from the same shaft operation. Gas turbines can operate on both gaseous and liquid fuels. Gaseous fuels include natural gas, process gas, and refinery gas. Liquid fuels typically include diesel. The units in this category are not power plant turbines (turbines that produce solely electric utility power). Some of these units are cogenerating units that, in addition to producing in-house power, also recover the useful energy from heat recovery for producing process steam.

Among the top non-power plant NOx emitting facilities in the RECLAIM universe, there are twenty gas turbines that are either major or large source units. Four of these units are currently utilizing some level of NOx control along with SCR. Six of these units are operated on an offshore oil drilling platform (outer continental shelf, or OCS). The OCS turbines, which are fired on diesel or process gas, have the highest NOx emission concentrations in this source category. Four of the OCS units with lower NOx parts per million (ppm) concentrations currently are equipped with SCR systems.

For the purpose of the analysis in this PEA, controlling NOx emissions from non-refinery/non power plant gas turbines is assumed to be accomplished with SCR technology. For a full description of this control technology, see the NOx Control Technologies section.

Internal Combustion Engines (Non-Refinery/Non-Power Plant)
Stationary Internal Combustion Engines (ICEs) are used primarily to drive pumps, compressors, or to generate power. There are generally two types of engines, spark-ignited (SI) or compression ignited (CI) engines. SI engines ignite the air/fuel mixture with a spark while CI engines use the heat of compression to ignite the fuel that is injected into the combustion

chamber. Engines can run at either stoichiometrically rich burn or lean burn conditions, depending on the air to fuel ratio. Rich burn combustion corresponds to an air-to-fuel ratio that is fuel-rich while lean burn combustion corresponds to a fuel-lean air-to-fuel ratio. Small SI engines typically run as rich burn, but many larger units as well as CI engines operate under lean burn conditions. For lean burn engines, more air is inducted than is required for complete combustion and the resultant exhaust oxygen level is high (over five percent). Rich burn engines typically operate very close to stoichiometric conditions by drawing only the necessary air to combust the fuel. SI engines are typically fired on gaseous fuels such as natural gas, while CI engines are fired on liquid fuels such as diesel.

Among the top NOx emitting facilities in the RECLAIM universe, there are 31 engines that are either major or large source units. Currently, there are nine rich burn engines equipped non-selective catalytic reduction (NSCR). Of the remaining 22 engines, there are 16 SI lean burn engines units and six CI lean burn units. The CI lean burn units are all operated on an offshore oil drilling platform (outer continental shelf, or OCS). The engine sizes range from a little over 700 brake horsepower (bhp) to 5,500 bhp. Diesel-fueled CI engines have the highest NOx emission concentrations in this source category while two-stroke SI engines have higher NOx emissions than four-stroke SI engines since the higher efficiencies in two-stroke engines translate to a hotter combustion temperature that can create more NOx.

For the ICEs operating at the 238 remaining NOx RECLAIM faculties, the ICEs would also need to meet the BARCT levels on a programmatic basis. The Draft PEA will evaluate the possibility that the SCR technology may be relied up in order to comply with the stationary ICEs portion of the proposed project. For a full description of this control technology, see the NOx Control Technologies section.

NOx Control Technologies

As reducing NOx emissions is the main objective of the currently proposed amendments to the RECLAIM program, there are two primary approaches for reducing NOx emissions: 1) by combustion control techniques that minimize the amount of NOx formed by the combustion equipment; or, 2) by installing a device that controls the NOx after it has been generated or post-combustion. At the time the NOP/IS was released, the consultants hired to assess the BARCT control technology options had not yet provided their recommendations or finalized their reports. As such, the NOP/IS contained a comprehensive list of multiple types of potential BARCT control technology options. Subsequently, however, the consultants presented their findings and some of the BARCT control technology options presented in the NOP/IS are now no longer considered to be viable or cost-effective options for the proposed project. For the reader to see how the list of BARCT control technology options changed since the release of the NOP/IS, Table 2-3 summarizes the potential control technologies that were initially considered in the NOP/IS as potential candidates for the BARCT analysis and shows the actual control technologies that are being considered for the BARCT analysis in this PEA. The following discussions will elaborate on the various technologies listed in Table 2-3 for consideration in this PEA.

Table 2-3

BARCT Control Technology Options for Top NOx Emitting Equipment/Processes

Equipment/Process	BARCT Control Technology Options Identified in NOP/IS	BARCT Control Technology To Be Analyzed in PEA
FCCUs	1. SCR 2. LoTOx^{TM} with scrubber 3. NOx reducing additives	1. SCR 2. LoTOx^{TM} with WGS
Refinery Process Heaters and Boilers	1. SCR 2. LoTOx^{TM} with scrubber 3. KnowNOx^{TM} with scrubber 4. Great Southern Flameless Heaters 5. ClearSign 6. Cheng Low NOx	SCR
Refinery Gas Turbines	1. SCR 2. Ammonia Slip Catalyst (ASC) 3. CO Catalyst 4. Dry Low Emissions (DLE or DLN) 5. Cheng Low NOx	SCR
SRU/TGUs	1. SCR 2. LoTOx^{TM} with scrubber 3. KnowNOx^{TM} with scrubber	1. LoTOx^{TM} with WGS 2. SCR
Petroleum Coke Calciner	1. LoTOx^{TM} with scrubber 2. UltraCat with scrubber	1. LoTOx^{TM} with scrubber 2. UltraCat with scrubber
Portland Cement Kilns	1. SCR with or without scrubber 2. UltraCat 3. SNCR	None[3]
Container Glass Melting Furnaces	1. SCR 2. UltraCat	1. SCR 2. UltraCat DGS
Sodium Silicate Furnaces	1. SCR 2. UltraCat	1. SCR 2. UltraCat DGS (without sorbent)
Metal Heat Treating Furnaces	SCR	SCR
ICEs (Non-Refinery/Non-Power Plant)	1. SCR 2. NSCR	SCR

[3] Because of CPCC's current permitting status for their Portland cement kilns (e.g., the permits were surrendered), CPCC operators will not be able to retrofit the Portland cement kilns with air pollution control equipment in response to the proposed project without first dealing with the permitting issues for the cement kilns. Thus, the installation of control technology and the secondary adverse environmental impacts that may be associated with such control technology is not a reasonably foreseeable consequence for CPCC under the present circumstances. Further, there are no other facilities in SCAQMD's jurisdiction that operate Portland cement kilns. Thus, this PEA does not contain an environmental analysis of the control technologies that were originally contemplated in the NOP/IS for the CPCC facility.

Table 2-1 (concluded)
BARCT Control Technology Options for Top NOx Emitting Equipment/Processes

Non-Refinery/Non-Power Plant Gas Turbines	1. SCR 2. Flue Gas Recirculation 3. Staged Combustion/Low NOx Burners 4. Water/Steam Injection 5. Dry Low Emissions (DLE or DLN)	SCR

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is post-combustion control equipment that is considered to be BARCT, if cost-effective and feasible, for NOx control of existing combustion sources such as boilers, process heaters, and FCCUs as it is capable of reducing NOx emissions by as much as 95 percent or higher. A typical SCR system design consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, an exhaust stack plus ancillary electronic instrumentation and operations control equipment. The way an SCR system reduces NOx is by 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, the catalyst, ammonia, and oxygen (from the air) in the flue gas exhaust reacts primarily (i.e., selectively) with NO and NO_2 to form nitrogen and water in the presence of a catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. There are two main types of catalysts: 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 (TiO_2) that is coated with either tungsten trioxide (WO_3), molybdic anhydride (MoO_3), vanadium pentoxide (V_2O_5), iron oxide (Fe_2O_3), or zeolite catalysts. 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 or more. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, et cetera.

For conventional SCRs, the minimum temperature for NOx reduction is 500 ^{o}F and the maximum operating temperature for the catalyst is 800 ^{o}F. Depending on the application, the type of fuel combusted, and the presence of sulfur compounds in the exhaust gas, the optimum flue gas temperature of an SCR system is case-by-case and will range between 550 ^{o}F and 750 ^{o}F to limit the occurrence of several undesirable side reactions at certain conditions. One of the major concerns with the SCR process is the poisoning of the catalyst due to the presence of sulfur and the oxidation of sulfur dioxide (SO_2) in the exhaust gas to sulfur trioxide (SO_3) and the subsequent reaction between SO_3 and ammonia to form ammonium bisulfate or ammonium sulfate. The formation of either ammonium bisulfate or ammonium sulfate depends on the amount of SO_3 and ammonia present in the flue gas and can cause equipment plugging downstream of the catalyst. The presence of particulates, heavy metals and silica in the flue gas exhaust can also limit catalyst performance.

However, minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range will help avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as 'ammonia slip.' Depending on the type of combustion equipment utilizing SCR technology, the typical amount of ammonia slip can vary between less than five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life.

In addition to the conventional SCR catalysts, there are high temperature SCR catalysts that can withstand temperatures up to 1200 ^{o}F and low temperature SCR catalysts that can operate below 500 ^{o}F.

Further, SCR manufacturers have developed Ammonia Slip Catalyst (ASC) which is a layer of catalyst that is installed downstream of the SCR catalyst to enhance the selective reduction of NO to N2 and supporting the oxidation of CO to CO2 while suppressing the oxidation of NH3 to NOx. Early generation of ASCs were based on precious metal which is highly active for NH_3 oxidation. The use of ASCs allow for operations at higher NH_3/NOx ratios to ensure complete NOx conversion while maintaining low ammonia slip.

Similar to ASC, CO catalyst is used in conjunction with the SCR catalyst to concurrently reduce NOx to N2 and oxidize CO and hydrocarbon to CO2 and water. CO catalyst is typically made of platinum, palladium or rhodium, and is capable of removing approximately 90 percent of CO and 85 percent to 90 percent of hydrocarbon or hazardous air pollutants from an exhaust stream.

Wet Gas Scrubbers (WGSs)
WGS technology is a multi-pollutant control system that primarily controls SOx and PM emissions but can be installed to function with NOx control equipment. WGSs can be used to control emissions from FCCUs, refinery process heaters and boilers, SRU/TGUs, petroleum coke calciners, and cement kilns. There are two types of wet gas scrubbers: 1) caustic-based non-regenerative WGS; and, 2) regenerative WGS.

In non-regenerative wet gas scrubbing, caustic soda (sodium hydroxide - NaOH) or other alkaline reagents, such as soda ash, are used as an alkaline absorbing reagent (absorbent) to capture SO_2 emissions. The absorbent captures SO_2 and sulfuric acid mist (H_2SO4) and converts it to various types of sulfites and sulfates (e.g., $NaHSO_3$, Na_2SO_3, and Na_2SO_4). The absorbed sulfites and sulfates are later separated by a purge treatment system and the treated water, free of suspended solids, is either discharged or recycled.

One example of the caustic-based non-regenerative scrubbing system is the proprietary Electro Dynamic Venturi (EDV) scrubbing system offered by BELCO Technologies Corporation (see Figure 2-7). An EDV scrubbing system consists of three main modules: 1) a spray tower module; 2) a filtering module; and, 3) a droplet separator module. The flue gas enters the spray tower module, which is an open tower with multiple layers of spray nozzles. The nozzles supply a high density stream of caustic/water solution that is directed in a countercurrent flow to the gas flow and encircles, encompasses, wets, and saturates the flue gas. Multiple stages of liquid/gas absorption occur in the spray tower module and SO_2 and acid mist are captured and converted to sulfites and sulfates. Large particles in the flue gas are also removed by impaction with the water droplets.

The flue gas saturated with heavy water droplets continues to move up the wet scrubber to the filtering module where the flue gas reaches super-saturation. At this point, water continues to condense and the fine particles in the gas stream begin to cluster together, to form larger and heavier groups of particles. Next, the flue gas, super-saturated with heavy water droplets, enters the droplet separator module causing the water droplets to impinge on the walls of parallel spin vanes and drain to the bottom of the scrubber.

The spent caustic/water solution purged from the WGS is later processed in a purge treatment unit. The purge treatment unit contains a clarifier that removes suspended solids for disposal. The effluent from the clarifier is oxidized with agitated air to help convert sulfites to sulfates and also reduce the chemical oxygen demand (COD) so that the effluent can be safely discharged to a wastewater system.

A regenerative WGS removes SO_2 from the flue gas by using a buffer solution that can be regenerated. The buffer is then sent to a regenerative plant where the SO_2 is extracted as concentrated SO_2. The concentrated SO_2 is then sent to a sulfur recovery unit (SRU) to recover the liquid SO_2, sulfuric acid and elemental sulfur as a by-product. When the inlet SO_2 concentrations are high, a substantial amount of sulfur-based by-products can be recovered and later sold as a commodity for use in the fertilizer, chemical, pulp and paper industries. For this reason, the use of a regenerative WGS is favored over a non-regenerative WGS.

One example of a regenerative scrubber is the proprietary LABSORB offered by BELCO Technologies Corporation [4, 5]. The LABSORB scrubbing process uses a patented non-organic aqueous solution of sodium phosphate salts as a buffer. This buffer is made from two common available products, caustic and phosphoric acid. The LABSORB system consists of: 1) a quench pre-scrubber; 2) an absorber; and, 3) a regeneration section which typically includes a stripper and a heat exchanger.

In the scrubbing side of the regenerative scrubbing system, the quench pre-scrubber is used to wash out any large particles that are carried over, plus any acid components in the flue gas such as hydrofluoric acid (HF), hydrochloric acid (HCl), and SO_3. The absorption of SO_2 is carried out in the absorber. The absorber typically consists of one single, high-efficiency packed bed scrubber filled with high-efficiency structural packing material. However, if the inlet SO_2 concentration is low, a multiple-staged packed bed scrubber, or a spray-and-plate tower scrubber, may be used instead to achieve an ultra-low outlet SO_2 concentration.

The third step in the regenerative wet gas scrubbing system is the regenerative section in which the SO_2-rich buffer stream is steam heated to evaporate the water from the buffer. The buffer stream is then sent to a stripper/condenser unit to separate the SO_2 from the buffer. The buffer free of SO_2 is returned to the buffer mixing tank while the condensed-SO_2 gas stream is sent back to the SRU for further treatment.

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[4] *Evaluating Wet Scrubbers,* Edwin H. Weaver of BELCO Technologies Corporation, Petroleum Technology Quarterly, Quarter 3, 2006.

[5] *A Logical and Cost Effective Approach for Reducing Refinery FCCU Emissions.* S.T. Eagleson, G. Billemeyer, N. Confuorto, and E. H. Weaver of BELCO, and S. Singhania and N. Singhania of Singhania Technical Services Pvt., India, Presented at PETROTECH 6th International Petroleum Conference in India, January 2005.

LoTOx™ Application with Wet Gas Scrubber

The LoTOx™ is a registered trademark of Linde LLC (previously BOC Gases) and was later licensed to BELCO of Dupont for refinery applications. LoTOx™ stands for "Low Temperature Oxidation" process in which ozone (O_3) is used to oxidize insoluble NOx compounds into soluble NOx compounds which can then be removed by absorption in a caustic, lime or limestone solution. The LoTOx™ process is a low temperature application, optimally operating at about 325 ^{o}F.

A typical combustion process produces about 95 percent NO and five percent NO_2. Because both NO and NO_2 are relatively insoluble in an aqueous solution, a WGS alone is not efficient in removing these insoluble compounds from the flue gas stream. However, with a LoTOx™ system and the introduction of O_3, NO and NO_2 can be easily oxidized into a highly soluble compound N_2O_5 (see Reactions 5 and 6) and subsequently converted to nitric acid (HNO_3) (see Reaction 7). Then, in a wet gas scrubber for example, the HNO_3 is rapidly absorbed in caustic (NaOH) (see Reaction 8), limestone or lime solution (see Reactions 9 and 10). In addition, because the rates of oxidizing reactions for NOx (see Reactions 5 and 6) are fast compared to the very slow SO_2 oxidation reaction (see Reaction 11), no ammonium bisulfate ($(NH_4)HSO_4$) or sulfur trioxide (SO_3) is formed.

$NO + O_3 \rightarrow NO_2 + O_2$	(Reaction 5 - Fast)
$2\ NO_2 + O_3 \rightarrow N_2O_5 + O_2$	(Reaction 6 – Fast)
$N_2O_5 + H_2O \rightarrow 2\ HNO_3$	(Reaction 7)
$HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$	(Reaction 8)
$2HNO3 + CaCO3 \rightarrow Ca(NO_3)_2 + H_2O + CO_2$	(Reaction 9)
$2HNO3 + Ca(OH) \rightarrow Ca(NO_3)_2 + 2H_2O$	(Reaction 10)
$SO_2 + O_3 \rightarrow SO_3 + O_2$	(Reaction 11 - Very slow)

The LoTOx™ process requires a source of oxygen and generates O_3 on site. Typically oxygen (O_2) is stored as a liquid in vacuum-jacketed vessels or is delivered by pipeline. O_3 is an unstable gas and it is typically generated on demand from the O_2 supply using an O_3 generator. An O_3 generator is shaped similar to a shell and tube heat exchanger and uses a corona discharge to dissociate the O_2 molecules into individual atoms so that the individual oxygen atoms combine with each other to form O_3. The LoTOx™ process contains an ozone injection manifold designed to achieve uniform distribution and complete mixing. A ratio of 1.75 parts NOx to 2.5 parts O_3 is needed in order to achieve a NOx conversion and reduction of 90 percent to 95 percent. Since sulfur dioxide (SO_2) is an ozone scavenger because it readily bonds with O_3 to form sulfur trioxide (SO_3), the LoTOx™ process typically has a very low O_3 slip (excess O_3) that ranges from zero ppmv to three ppmv. Figure 2-6 shows a schematic of the O_3 generation process.

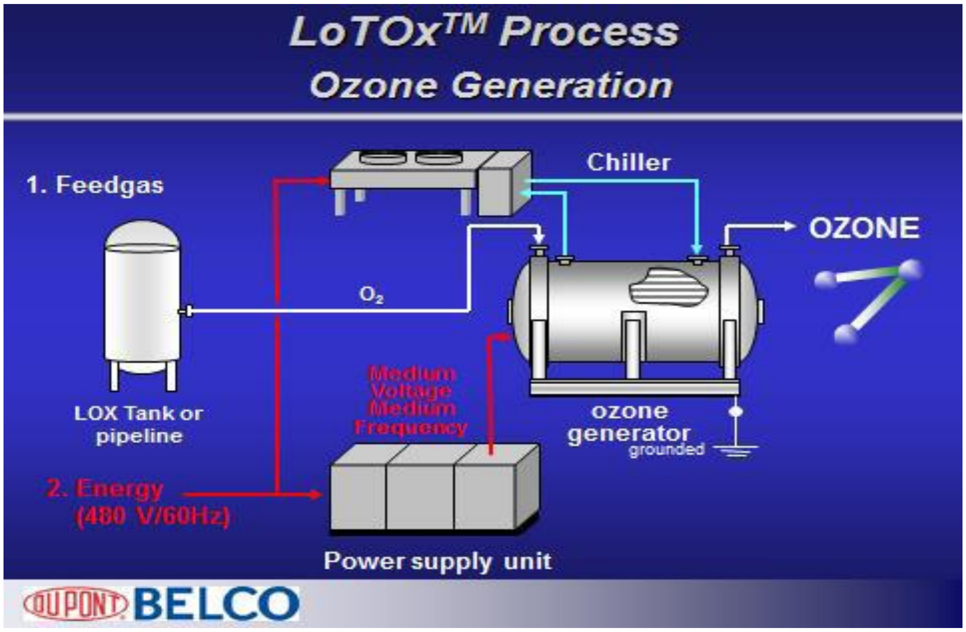

Figure 2-6: Ozone Generation Process

The LoTOx™ process can be integrated with any type of wet scrubbers (e.g., venturi, packed beds), semi-dry scrubbers, or wet electrostatic precipitators (ESPs). For example, Linde has engineered more than 24 LoTOx™ applications for EDV™ scrubbers engineered by BELCO since 2007 for refinery FCCU applications. A LoTOx™ system with an EDV™ scrubber is shown in Figure 2-7.

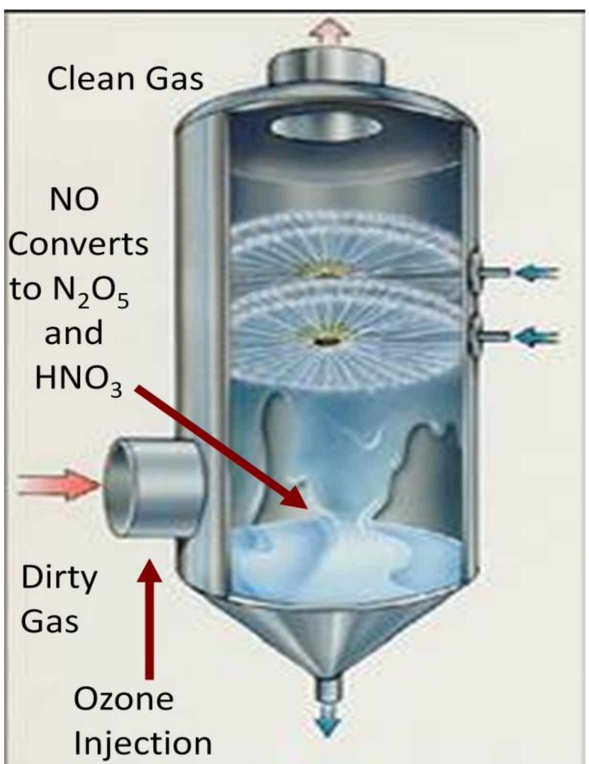

Figure 2-7: EDV Scrubber with LoTOx™ Application

In addition, MECS, BELCO's sister company, has engineered more than two dozen DynaWave scrubbers with LoTOx™ systems specifically designed for refinery SRU/TGUs. Figure 2-8 shows a schematic for a DynaWave scrubber with a LoTOx™ application.

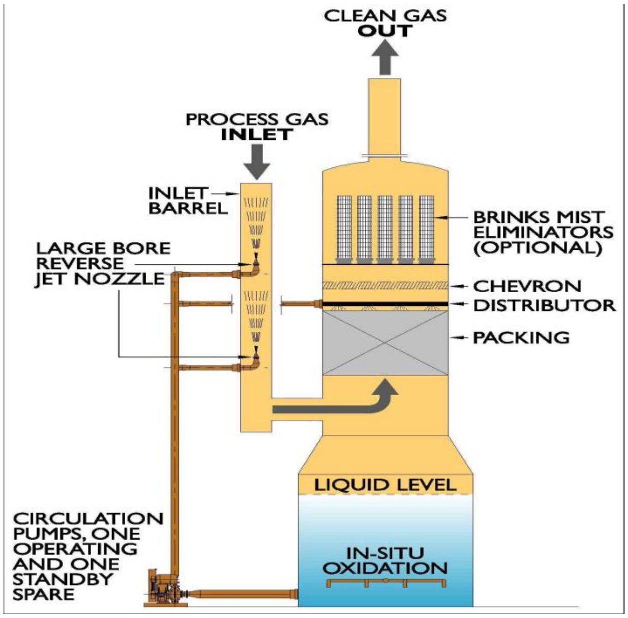

Figure 2-8: DynaWave Scrubber with LoTOx™ Application

When compared to SCR technology, the LoTOx™ application has several advantages, as follows:

- Unlike SCR which operates at high temperatures, LoTOx™ is a low temperature operating system that does not require additional heat input to maintain operational efficiency and enable maximum heat recovery of high temperature combustion gases.
- Unlike SCR which is primarily designed to reduce only NOx, LoTOx™ can be integrally connected to a scrubber (e.g., wet or semi-dry scrubber, or wet electrostatic ESP) and become a multi-component air pollution control system capable of reducing NOx, SOx and PM in one system.
- There is no formation of ammonia slip, SO_3, or $(NH_4)HSO_4$ with the LoTOx™ process.

UltraCat

UltraCat is a commercially available multi-pollutant control technology designed to remove NOx and other pollutants such as SO_2, PM, HCl, Dioxins, and HAPs such as mercury in low temperature applications. UltraCat technology is comprised of filter tubes which are made of fibrous ceramic materials embedded with proprietary catalysts. The optimal operating temperature range of an UltraCat system is approximately 350 ^{o}F to 750 ^{o}F. In order to achieve a NOx removal efficiency of approximately 95 percent, aqueous ammonia is injected upstream of the UltraCat filters. In addition, to remove SO_2, HCl, and other acid gases with a removal efficiency ranging from 90 percent to 98 percent, dry sorbent such as hydrated lime, sodium bicarbonate or trona is also injected upstream of the UltraCat filters. UltraCat is also capable of controlling particulates to a level of 0.001 grains per standard cubic foot of dry gas (dscf).

The UltraCat filters are arranged in a baghouse configuration with a low pressure drop such as five inches water column (inH20) across the system. The UltraCat system is equipped with a reverse pulse-jet cleaning action that back flushes the filters with air and inert gas to dislodge the PM deposited on the outside of the filter tubes. Depending on the loading, catalytic filter tubes need to be replaced every five to 10 years. The UltraCat system is shown in Figure 2-9.

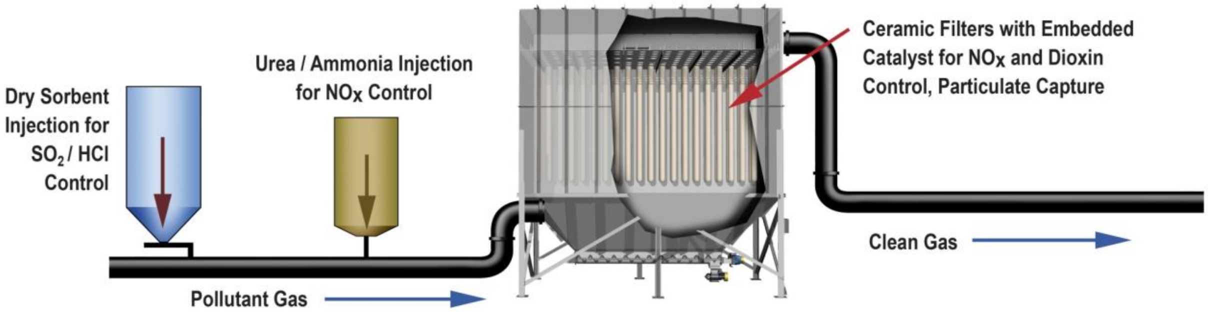

Figure 2-9: UltraCat System

CHAPTER 3

EXISTING SETTING

3.0 INTRODUCTION

In order to determine the significance of the impacts associated with a proposed project, it is necessary to evaluate the project's impacts against the backdrop of the environment as it exists at the time the NOP/IS is published. CEQA Guidelines §15360 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" (see also Public Resources Code §21060.5). According to CEQA Guidelines §15125 (a), a CEQA document must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the 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 programmatic in nature (e.g., PEA) 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 NOP/IS (see Appendix E) that may be adversely affected by the proposed project. These areas include the following topics: aesthetics; air quality and GHGs; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic.

SUBCHAPTER 3.1

AESTHETICS

3.1 AESTHETICS

This subchapter contains an overview of existing aesthetic resources, including scenic highways and coastal zones within the District.

3.1.1 Regulatory Setting

3.1.1.1 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).

3.1.1.2 State

<u>California Coastal Act</u>

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 (Public Resources Code. California Coastal Act [Chapter 3 (Coastal Resources Planning and Management Policies) Article 6, §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).

<u>State Scenic Highway Program</u>

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.).

3.1.1.3 Local

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.

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.

3.1.2 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.

3.1.2.1 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 Final Program Environmental Impact Report (PEIR) prepared for the Southern California Association of Governments (SCAG) 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)[1], 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

[1] SCAG, Final PEIR for the 2012-2035 RTP/SCS, SCH# 2011051018; April 4, 2012. http://rtpscs.scag.ca.gov/Pages/Final-2012-PEIR.aspx

preservation and enhancement of visual quality in their plans or regulations[2]. An example of such guidance can be found in Caltrans Scenic Highway Guidelines which contains examples of visual intrusions[3], 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 Guidelines – Examples of Visual 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.

[2] 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.

[3] Caltrans, Scenic Highway Guidelines - Appendix E, October 2008; (Caltrans, 2008). http://www.dot.ca.gov/hq/LandArch/scenic/guidelines/scenic_hwy_guidelines_04-12-2012.pdf

TABLE 3.1-1 (Continued)
Caltrans Scenic Highway Guidelines – Examples of Visual 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 Guidelines – Examples of Visual 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.

3.1.2.2 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 Los Angeles County Draft 2014 General Plan 2035[4] 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, 2014).

The Orange County General Plan[5] 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 Riverside County General Plan[6] 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, 2014).

The County of San Bernardino 2007 General Plan[7] 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, 2014).

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[4] Los Angeles County, 2014, 2014 Draft General Plan 2035, July 2014. http://planning.lacounty.gov/generalplan/draft2014

[5] Orange County, 2011, Orange County General Plan 2005, March 2011; (Orange County, 2011). http://ocplanning.net/planning/generalplan2005

[6] Riverside County, 2014. Riverside County General Plan, March 2014. http://planning.rctlma.org/ZoningInformation/GeneralPlan.aspx

[7] San Bernardino County, 2014. County of San Bernardino 2007 General Plan, last amended April 2014. http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FINALGP.pdf

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.

3.1.2.3 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

TABLE 3.1-2 (Continued)
Scenic Highways Within District Borders

Route	County	Location	Description	Miles	Designation
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
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 August 2014. http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm
(a) ODSSH = Officially Designated State Scenic Highway
(b) ODCSH = 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/SBD	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	SBD/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	SBD	SR-58 near Barstow/SR-127 near Baker	76.9-R136.6
18	SBD	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	SBD	SR-330 near Highland/I-10 near Redlands	T29.5-33.3
38	SBD	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	SBD	Barstow/Needles	0.0-154.6
57	Orange/LA	SR-90/SR-60 near City of Industry	19.9-R4.5
58	(Kern)/SBD	SR-14 near Mojave/I-15 near Barstow	112.0-R4.5
62	Riverside/SBD	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	SBD/(Inyo)	I-15 near Baker/Nevada State Line	L0.0-49.4
138	SBD	SR-2 near Wrightwood/SR-18 near Mt. Anderson	6.6-R37.9
142	SBD	Orange County Line/Peyton Drive	0.0-4.4
173	SBD	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	SBD	SR-62 near Yucca Valley/I-15 near Barstow	0.0-78.1
330	SBD	SR-30 near Highland/SR-18 near Running Springs	29.5-44.1

Source: Caltrans, Eligible and Officially Designated Routes, accessed August 2014. http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

LA = Los Angeles SBD = San Bernardino SD = San Diego SBar = Santa Barbara
SLO = San Luis Obispo SR = State Route ( ) = County not within the District

3.1.2.4 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 AND GREENHOUSE GASES

Criteria Air Pollutants

Non-Criteria Air Pollutants

3.2 AIR QUALITY AND GREENHOUSE GASES

This subchapter provides an overview of the existing air quality setting for each criteria pollutant and their precursors, as well as the human health effects resulting from exposure to these pollutants. In addition, this subchapter includes a discussion of non-criteria pollutants such as TACs and GHGs, and climate change.

3.2.1 Criteria Air Pollutants and Identification of Health Effects

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, carbon monoxide (CO), nitrogen dioxide (NO2), PM10, PM2.5, sulfur dioxide (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 commonly 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. SCAQMD also has a general responsibility pursuant to Health & Safety Code (HSC) §41700 to control emissions of air contaminants and prevent endangerment to public health.

3.2.1.1 Regional Baseline

Air quality in the area of the SCAQMD's jurisdiction has shown substantial improvement over the last three decades. Nevertheless, some federal and state air quality standards are still exceeded frequently and by a wide margin. Of the National Ambient Air Quality Standards (NAAQS) established for seven criteria pollutants (ozone, CO, NO2, PM10, PM2.5, SO2, and lead), the area within the SCAQMD's jurisdiction is only in attainment with CO, SO2, PM10 and the annual NO2 standards. The SCAQMD is designated as unclassifiable/attainment for the hourly NO2 standard. The EPA intends to redesignate areas after sufficient air quality data are available.

Recent air quality data shows the 1997 PM2.5 standard (15 $\mu g/m^3$) is being met, but falls short in attaining the 2012 annual PM2.5 standard of 12 $\mu g/m^3$. Recent monitoring data also shows that the 2006 24-hour NAAQS for PM2.5 will not be achieved by 2015, due partially to drought conditions and to excessive emissions. The upcoming 2016 AQMP will evaluate PM2.5 emissions and possible control measures to attain the 2006 and 2012 standards by 2019 - 2025. The 2016 AQMP will also demonstrate attainment of the 2008 8-hour ozone standard (75 ppb) by year 2032, and provide an update to the previous 1997 8-hour standard (80 ppb) to be met by 2023. The 2016 AQMP must be submitted to the USEPA by July 20, 2016.

In 2010, a portion of Los Angeles County was designated as not attaining the NAAQS of 0.15 $\mu g/m^3$ for lead. SCAQMD identified two large lead-acid battery recycling facilities as possible sources of lead. One of the facilities was the main contributor to the area's nonattainment status. In response to the nonattainment designation, the State submitted the *Final 2012 Lead State Implementation Plan – Los Angeles County* to the USEPA on June

20, 2012. The plan outlines steps that will bring the area into attainment with the standard. As of February 11, 2014, the USEPA announced in the Federal Register (FR) final approval of the lead air quality plan, effective 30 days after publication (e.g., March 12, 2014).

The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3.2-1. The SCAQMD monitors levels of various criteria pollutants at 36 monitoring stations. The 2013 air quality data from SCAQMD's monitoring stations are presented in Table 3.2-2 for ozone, CO, NO2, PM10, PM2.5, SO2, lead and PM10 sulfate.

TABLE 3.2-1
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	0.090 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	
Fine Particulate Matter (PM2.5)	24-hour	No State Standard	35 µg/m^3 [c)]	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	12 µg/m^3	

TABLE 3.2-1 (continued)
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard a)	Federal Primary Standard b)	Most Relevant Effects
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)	
Nitrogen Dioxide (NO_2)	1-Hour	0.180 ppm (339 µg/m^3)	100 ppb d) (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	0.250 ppm (655 µg/m^3)	75 ppb e) (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	0.040 ppm (105 µg/m^3)	No Federal Standard	
Sulfate	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	0.030 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.
	Rolling 3-Month Average	No State Standard	0.150 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 State standard is a visibility based standard not a health based standard and is intended to limit the frequency and severity of visibility impairment due to regional haze. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent.

TABLE 3.1-1 (concluded)
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard [a)]	Federal Primary Standard [b)]	Most Relevant Effects
Vinyl Chloride	24-Hour	0.010 ppm ($26\ \mu g/m^3$)	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 O3, CO, SO2 (1-hour and 24-hour), NO2, PM10, and PM2.5 are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[b)] The NAAQS, 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.

[c)] The federal 24-hour PM2.5 standard is 35 $\mu g/m^3$ (98th percentile concentration).

[d)] The federal one-hour NO2 standard is 100 ppb or 0.100 ppm (98th percentile concentration).

[e)] The federal one-hour SO2 standard is 75 ppb or 0.075 ppm (99th percentile concentration).

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

TABLE 3.2-2
2013 Air Quality Data for SCAQMD

CARBON MONOXIDE (CO) [a)]			
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. ppm, 8-hour
LOS ANGELES COUNTY			
1	Central Los Angeles	330	2.0
2	Northwest Coastal Los Angeles County	340	1.3
3	Southwest Coastal Los Angeles County	281*	2.5
4	South Coastal Los Angeles County 1	249*	2.0
4	South Coastal Los Angeles County 2	--	--
4	South Coastal LA County 3	323	2.6
6	West San Fernando Valley	323	2.3
7	East San Fernando Valley	335	2.4
8	West San Gabriel Valley	201*	1.7
9	East San Gabriel Valley 1	343	1.7
9	East San Gabriel Valley 2	347	0.8
10	Pomona/Walnut Valley	340	1.6
11	South San Gabriel Valley	347	2.0
12	South Central Los Angeles County	338	3.5
13	Santa Clarita Valley	352	0.8
ORANGE COUNTY			
16	North Orange County	355	2.2
17	Central Orange County	333	2.6
18	North Coastal Orange County	313	2.0
19	Saddleback Valley	356	1.3
RIVERSIDE COUNTY			
22	Norco/Corona	--	--
23	Metropolitan Riverside County 1	334	2.0
23	Metropolitan Riverside County 2	318	1.6
23	Mira Loma	339	1.9
24	Perris Valley	--	--
25	Lake Elsinore	336	0.6
26	Temecula	--	--
29	Banning Airport	--	--
30	Coachella Valley 1**	354	1.5
30	Coachella Valley 2**	--	--
SAN BERNARDINO COUNTY			
32	Northwest San Bernardino Valley	340	1.7
33	Southwest San Bernardino Valley	--	--
34	Central San Bernardino Valley 1	337	1.3
34	Central San Bernardino Valley 2	340	1.7
35	East San Bernardino Valley	--	--
37	Central San Bernardino Mountains	--	--
38	East San Bernardino Mountains	--	--
DISTRICT MAXIMUM			3.5
SOUTH COAST AIR BASIN			3.5

KEY: ppm = parts per million -- = Pollutant not monitored * Incomplete Data ** 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 3.2-2 (Continued)
2013 Air Quality Data for SCAQMD

OZONE (O_3)

Source Recep Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hr	Max. Conc. in ppm 8-hr	Fourth High Conc. ppm 8-hr	Health Advisory ≥ 0.15 ppm 1-hr	No. Days Standard Exceeded: Federal: Old > 0.124 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	365	0.081	0.069	0.060	0	0	0	0	0
2	Northwest Coastal LA County	359	0.088	0.075	0.059	0	0	0	0	1
3	Southwest Coastal LA County	352	0.105	0.081	0.060	0	0	1	1	1
4	South Coastal Los Angeles County 1	267*	0.092	0.070	0.060	0	0	0	0	0
4	South Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 3	362	0.090	0.069	0.057	0	0	0	0	0
6	West San Fernando Valley	320	0.124	0.092	0.084	0	0	11	7	21
7	East San Fernando Valley	362	0.110	0.083	0.079	0	0	6	4	17
8	West San Gabriel Valley	211*	0.099	0.075	0.070	0	0	0	2	2
9	East San Gabriel Valley 1	361	0.115	0.085	0.080	0	0	6	7	15
9	East San Gabriel Valley 2	340	0.135	0.100	0.088	0	1	24	24	43
10	Pomona/Walnut Valley	355	0.125	0.099	0.085	0	1	15	12	22
11	South San Gabriel Valley	363	0.101	0.072	0.070	0	0	0	2	3
12	South Central Los Angeles County	358	0.090	0.080	0.063	0	0	1	0	1
13	Santa Clarita Valley	365	0.134	0.104	0.094	0	2	40	30	58
ORANGE COUNTY										
16	North Orange County	363	0.104	0.078	0.066	0	0	1	2	2
17	Central Orange County	340	0.084	0.070	0.063	0	0	0	0	0
18	North Coastal Orange County	385	0.095	0.083	0.065	0	0	1	1	2
19	Saddleback Valley	365	0.104	0.082	0.074	0	0	2	2	5
RIVERSIDE COUNTY										
22	Norco/Corona	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	357	0.123	0.103	0.094	0	0	26	13	38
23	Metropolitan Riverside County 2	--	--	--	--	--	--	--	--	--
23	Mira Loma	365	0.118	0.096	0.092	0	0	21	11	32
24	Perris Valley	344	0.108	0.090	0.088	0	0	34	17	60
25	Lake Elsinore	362	0.102	0.089	0.081	0	0	12	6	25
26	Temecula	324	0.093	0.078	0.075	0	0	3	0	12
29	Banning Airport	254*	0.115	0.103	0.091	0	0	41	24	66
30	Coachella Valley 1**	365	0.113	0.104	0.090	0	0	46	10	82
30	Coachella Valley 2**	365	0.105	0.087	0.085	0	0	18	2	38
SAN BERNARDINO COUNTY										
32	Northwest San Bernardino Valley	365	0.143	0.111	0.095	0	3	27	25	44
33	Southwest San Bernardino Valley	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	363	0.151	0.122	0.100	1	2	42	34	68
34	Central San Bernardino Valley 2	361	0.139	0.112	0.097	0	2	36	22	53
35	East San Bernardino Valley	356	0.133	0.119	0.104	0	3	63	43	93
37	Central San Bernardino Mountains	365	0.120	0.105	0.099	0	0	72	45	101
38	East San Bernardino Mountains	--	--	--	--	--	--	--	--	--
	DISTRICT MAXIMUM		0.151	0.122	0.104	1	3	72	45	101
	SOUTH COAST AIR BASIN		0.151	0.122	0.104	1	5	88	70	119

KEY: ppm = parts per million -- = Pollutant not monitored * Incomplete Data ** Salton Sea Air Basin

TABLE 3.2-2 (Continued)
2013 Air Quality Data for SCAQMD

NITROGEN DIOXIDE (NO_2) [b)]					
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	1-hour Max. Conc. ppb	1-hour 98th Percentile Conc. ppb	Annual Average AAM Conc. ppb
LOS ANGELES COUNTY					
1	Central Los Angeles	301	90.3	62.6	21.8
2	Northwest Coastal Los Angeles County	291	51.2	48.8	14.5
3	Southwest Coastal Los Angeles County	334	77.8	58.0	11.8
4	South Coastal Los Angeles County 1	234*	66.9	55.7	14.0
4	South Coastal Los Angeles County 2	--	--	--	--
4	South Coastal LA County 3	325	81.3	71.3	21.5
6	West San Fernando Valley	258*	58.2	51.7	14.4
7	East San Fernando Valley	284	72.5	60.0	20.2
8	West San Gabriel Valley	200*	66.7	60.3	19.1
9	East San Gabriel Valley 1	352	76.9	56.7	17.7
9	East San Gabriel Valley 2	349	55.7	50.4	13.0
10	Pomona/Walnut Valley	343	78.8	64.8	22.5
11	South San Gabriel Valley	337	79.4	60.6	20.6
12	South Central Los Angeles County	340	69.8	61.8	17.6
13	Santa Clarita Valley	362	65.4	45.0	14.4
ORANGE COUNTY					
16	North Orange County	269*	85.0	53.3	14.8
17	Central Orange County	301	81.6	58.8	18.0
18	North Coastal Orange County	330	75.7	53.2	11.6
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metropolitan Riverside County 1	318	59.6	54.8	17.3
23	Metropolitan Riverside County 2	257*	57.6	50.7	15.8
23	Mira Loma	333	53.8	50.7	13.7
24	Perris Valley	--	--	--	--
25	Lake Elsinore	294	46.6	40.0	8.4
26	Temecula	--	--	--	--
29	Banning Airport	308	51.9	45.0	8.5
30	Coachella Valley 1**	359	52.3	38.5	7.5
30	Coachella Valley 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	276*	62.1	53.3	17.7
33	Southwest San Bernardino Valley	--	--	--	--
34	Central San Bernardino Valley 1	335	81.7	60.6	20.6
34	Central San Bernardino Valley 2	291	72.2	54.5	17.6
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM			90.3	71.3	22.5
SOUTH COAST AIR BASIN			90.3	71.3	22.5

KEY: ppm = parts per million -- = Pollutant not monitored * Incomplete Data ** Salton Sea Air Basin
ppb = parts per billion AAM = Annual Arithmetic Mean

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 (180 ppb) and 0.030 ppm (30 ppb).

TABLE 3.2-2 (Continued)
2013 Air Quality Data for SCAQMD

SULFUR DIOXIDE (SO_2) c)				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Conc. ppb, 1-hour	99th Percentile Conc. ppb, 1-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	312	6.3	5.2
2	Northwest Coastal Los Angeles County	--	--	--
3	Southwest Coastal Los Angeles County	322	10.1	6.5
4	South Coastal Los Angeles County 1	178*	21.8	10.1
4	South Coastal Los Angeles County 2	--	--	--
4	South Coastal LA County 3	349	15.1	11.6
6	West San Fernando Valley	--	--	--
7	East San Fernando Valley	342	10.8	4.2
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	296	4.2	3.3
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	--	--	--
23	Metropolitan Riverside County 1	354	8.1	4.6
23	Metropolitan Riverside County 2	--	--	--
23	Mira Loma	--	--	--
24	Perris Valley	--	--	--
25	Lake Elsinore	--	--	--
26	Temecula	--	--	--
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	298	3.8	3.1
34	Central San Bernardino Valley 2	--	--	--
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			21.8	11.6
SOUTH COAST AIR BASIN			21.8	11.6

KEY: ppm = parts per million -- = Pollutant not monitored * Incomplete Data ** Salton Sea Air Basin
ppb = parts per billion

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 (250 ppb) and 24-hour average SO_2 > 0.04 ppm (40 ppb).

TABLE 3.2-2 (Continued)
2013 Air Quality Data for SCAQMD

SUSPENDED PARTICULATE MATTER PM10 d)						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	No. (%) Samples Exceeding Standard		Annual Average AAM Conc. e) $\mu g/m^3$
				Federal > 150 $\mu g/m^3$, 24-hour	State > 50 $\mu g/m^3$, 24-hour	
LOS ANGELES COUNTY						
1	Central Los Angeles	60	57	0	1(2%)	29.5
2	Northwest Coastal Los Angeles County	--	--	--	--	--
3	Southwest Coastal Los Angeles County	56	38	0	0	20.8
4	South Coastal Los Angeles County 1	43*	37	0	0	23.2
4	South Coastal Los Angeles County 2	56	54	0	1(2%)	27.3
4	South Coastal LA County 3	--	--	--	--	--
6	West San Fernando Valley	--	--	--	--	--
7	East San Fernando Valley	58	52	0	1(2%)	28.5
8	West San Gabriel Valley	--	--	--	--	--
9	East San Gabriel Valley 1	61	76	0	6(10%)	33.0
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	60	43	0	0	21.6
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	59	77	0	1(2%)	25.4
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	61	51	0	1(2%)	19.3
RIVERSIDE COUNTY						
22	Norco/Corona	57	58	0	2(4%)	28.3
23	Metropolitan Riverside County 1	119	135	0	10(8%)	33.8
23	Metropolitan Riverside County 2	--	--	--	--	--
23	Mira Loma	59	147	0	14(24%)	41.1
24	Perris Valley	57	70	0	10(18%)	33.6
25	Lake Elsinore	--	--	--	--	--
26	Temecula	--	--	--	--	--
29	Banning Airport	61	64	0	1(2%)	20.6
30	Coachella Valley 1**	60	129	0	3(5%)	22.6
30	Coachella Valley 2**	120	129+	0+	23(19%)	38.1
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	--	--	--	--	--
33	Southwest San Bernardino Valley	60	115	0	3(5%)	33.2
34	Central San Bernardino Valley 1	61	90	0	19(31%)	40.6
34	Central San Bernardino Valley 2	60	102	0	3(5%)	31.3
35	East San Bernardino Valley	61	72	0	2(3%)	27.1
37	Central San Bernardino Mountains	60	37	0	0	21.4
38	East San Bernardino Mountains	--	--	--	--	--
	DISTRICT MAXIMUM		147+	0+	23	41.1
	SOUTH COAST AIR BASIN		147	0	33	41.1

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

AAM = Annual Arithmetic Mean + = High PM10 data sample (159 $\mu g/m^3$ on August 23, 2013 at Indio) excluded due to the high wind in accordance with the EPA Exceptional Event Regulation. Also, multiple high PM10FEM data recorded in Coachella Valley and the Basin were excluded.

d) Federal Reference Method (FRM) PM10 samples were collected every six days at all sites except for Stations 4144 and 4157, where samples were collected every three days. PM10 statistics listed above are for the FRM data only. Federal Equivalent Method (FEM) PM10 continuous monitoring instruments were operated at some of the above locations. Max 24-hour average PM10 at sites with FEM monitoring was 153 $\mu g/m^3$ at Indio (155 $\mu g/m^3$ is needed to exceed the PM10 standards.

e) Federal annual PM10 standard (AAM > 50 $\mu g/m^3$) was revoked in 2006. State standard is annual average (AAM) > 20 $\mu g/m^3$.

TABLE 3.2-2 (Continued)
2013 Air Quality Data for SCAQMD

FINE PARTICULATE MATTER PM2.5 [f]						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. µg/m^3, 24-hour	98th Percentile Conc. in µg/m^3 24-hr	No. (%) Samples Exceeding Federal Std > 35 µg/m^3, 24-hour	Annual Average AAM Conc. [g] µg/m^3
LOS ANGELES COUNTY						
1	Central Los Angeles	344	43.1	29.0	1(0.3%)	11.95
2	Northwest Coastal Los Angeles County	--	--	--	--	--
3	Southwest Coastal Los Angeles County	--	--	--	--	--
4	South Coastal Los Angeles County 1	331	47.2	26.1	2(0.6%)	11.34
4	South Coastal Los Angeles County 2	341	42.9	24.6	1(0.3%)	10.97
4	South Coastal LA County 3	--	--	--	--	--
6	West San Fernando Valley	118	41.8	23.0	1(0.8%)	9.71
7	East San Fernando Valley	346	45.1	30.4	4(1.2%)	12.15
8	West San Gabriel Valley	64*	25.7	20.5	0(0%)	10.13
9	East San Gabriel Valley 1	120	29.6	26.4	0(0%)	10.54
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	114	29.1	28.8	0(0%)	11.56
12	South Central Los Angeles County	113	52.1	24.3	1(0.9%)	11.95
13	Santa Clarita Valley	--	--	--	--	--
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	331	37.8	22.7	1(0.3%)	10.09
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	117	28.0	17.5	0(0%)	8.08
RIVERSIDE COUNTY						
22	Norco/Corona	--	--	--	--	--
23	Metropolitan Riverside County 1	353	60.3	34.6	6(1.7%)	12.50
23	Metropolitan Riverside County 2	117	53.7	29.2	1(0.9%)	11.28
23	Mira Loma	355	56.5	37.5	9(2.5%)	14.12
24	Perris Valley	--	--	--	--	--
25	Lake Elsinore	--	--	--	--	--
26	Temecula	--	--	--	--	--
29	Banning Airport	--	--	--	--	--
30	Coachella Valley 1**	117	18.5	13.8	0(0%)	6.52
30	Coachella Valley 2**	118	25.8	15.9	0(0%)	8.35
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	--	--	--	--	--
33	Southwest San Bernardino Valley	110	49.3	26.8	1(0.9%)	11.98
34	Central San Bernardino Valley 1	121	43.6	33.1	1(0.8%)	12.26
34	Central San Bernardino Valley 2	110	55.3	33.4	1(0.9%)	11.41
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	59	35.5	35.1	1(1.7%)	9.67
DISTRICT MAXIMUM			60.3	37.5	9	14.12
SOUTH COAST AIR BASIN			60.4	37.5	13	14.12

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

f) PM2.5 samples were collected every three 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 six days. PM10 statistics listed above are for the Federal Reference Method (FRM) data only. Federal Equivalent Method (FEM) PM2.5 continuous monitoring instruments were operated at some of the above locations for special purposes with the max 24-hour average concentration recorded of 83.2 µg/m^3, (at Mira Loma).

g) USEPA has revised the federal annual PM2.5 standard from annual average (AAM) > 15.0 µg/m^3 to 12 µg/m^3, effective March 18, 2013. State standard is annual average (AAM) > 12 µg/m^3.

TABLE 3.2-2 (Concluded)
2013 Air Quality Data for SCAQMD

		LEAD h)		PM10 SULFATES i)	
Source Receptor Area No.	Location of Air Monitoring Station	Max. Monthly Average Conc. μg/m^3	Max. 3-Months Rolling Averages, μg/m^3	No. Days of Data	Max. Conc. μg/m^3, 24-hour
LOS ANGELES COUNTY					
1	Central Los Angeles	0.013	0.011	60	5.8
2	Northwest Coastal Los Angeles County	--	--	--	--
3	Southwest Coastal Los Angeles County	0.005	0.004	56	5.6
4	South Coastal Los Angeles County 1	0.006	0.006	43*	4.5
4	South Coastal Los Angeles County 2	0.012	0.009	56	4.8
4	South Coastal LA County 3	--	--	--	--
6	West San Fernando Valley	--	--	--	--
7	East San Fernando Valley	--	--	58	5.4
8	West San Gabriel Valley	--	--	--	--
9	East San Gabriel Valley 1	--	--	61	4.8
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.012	0.011	--	--
12	South Central Los Angeles County	0.014	0.011	--	--
13	Santa Clarita Valley	--	--	60	3.7
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	59	4.7
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	61	4.4
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	57	4.2
23	Metropolitan Riverside County 1	0.010	0.009	119	4.2
23	Metropolitan Riverside County 2	0.007	0.006	--	--
23	Mira Loma	--	--	59	4.2
24	Perris Valley	--	--	57	3.4
25	Lake Elsinore	--	--	--	--
26	Temecula	--	--	--	--
29	Banning Airport	--	--	61	2.9
30	Coachella Valley 1**	--	--	60	3.5
30	Coachella Valley 2**	--	--	120	3.9
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	0.008	0.006	--	--
33	Southwest San Bernardino Valley	--	--	60	4.8
34	Central San Bernardino Valley 1	--	--	61	4.1
34	Central San Bernardino Valley 2	0.010	0.010	60	4.6
35	East San Bernardino Valley	--	--	61	3.6
37	Central San Bernardino Mountains	--	--	60	3.6
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		0.013++	0.011++		5.8
SOUTH COAST AIR BASIN		0.013++	0.011++		5.8

KEY: μg/m^3 = micrograms per cubic meter of air -- = Pollutant not monitored * Incomplete Data ** Salton Sea Air Basin

++ = Higher lead concentrations were recorded at source-oriented monitoring sites immediately downwind of stationary lead sources. Maximum monthly and 3-month rolling averages recorded were 0.14 μg/m^3 and 0.10 μg/m^3, respectively.

h) Federal lead standard is 3-month rolling average > 0.15 μg/m^3; and state standard is monthly average ≥ 1.5 μg/m^3. Lead statistics listed above are for population-oriented sites only. Lead standards were not exceeded.

i) State sulfate standard is 24-hour ≥ 25 μg/m^3. There is no federal standard for sulfate.

Carbon Monoxide

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, CO occurs in the atmosphere at an average background concentration of 0.04 parts per million (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. Approximately 98 percent of the CO emitted into the Basin's atmosphere is 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.

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.

CO concentrations were measured at 26 locations in the Basin and neighboring Salton Sea Air Basin (SSAB) areas in 2013. Carbon monoxide concentrations did not exceed any of the federal or state standards in 2013. The highest eight-hour average carbon monoxide concentration recorded (3.5 ppm in the South Central Los Angeles County area) was 39 percent of the federal eight-hour carbon monoxide standard of 9.0 ppm. The state eight-hour standard is also 9.0 ppm.

The 2003 AQMP revisions to the SCAQMD's CO Plan served two purposes: 1) it replaced the 1997 attainment demonstration that lapsed at the end of 2000; and, 2) it provided the basis for a CO maintenance plan in the future. In 2004, the SCAQMD formally requested the USEPA to re-designate the Basin from non-attainment to attainment with the CO National Ambient Air Quality Standards. On February 24, 2007, USEPA published in the FR 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 USEPA. On May 11, 2007, USEPA published in the FR its final decision to approve the SCAQMD's request for re-designation from non-attainment to attainment for CO, effective June 11, 2007.

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 0.02 ppm to 0.045 ppm), however recent studies indicate that the 'background' value of ozone may be rising due to the increased influence of pollution from global pollution produced outside of the SCAQMD[3, 4].

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.

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[3] Fiore et al, "Background Ozone Over the United States in Summer: Origin, Trend, and Contribution to Pollution Episodes," Journal of Geophysical Research - Atmospheres, Vol. 107 - D15, 2002, pp. ACH 11-1–ACH 11-25. http://onlinelibrary.wiley.com/doi/10.1029/2001JD000982/abstract

[4] R. Vingarzan, "A Review of Surface Ozone Background Levels and Trends," Atmospheric Environment, Volume 38,2004, pp. 3431–3442. http://www.sciencedirect.com/science/article/pii/S1352231004002808

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 2013, the SCAQMD regularly monitored ozone concentrations at 31 locations in the Basin and SSAB. Maximum ozone concentrations for all areas monitored were below the stage 1 episode level (0.20 ppm). Maximum ozone concentrations in the SSAB areas monitored by the SCAQMD were lower than the maximum values found in the Basin.

In 2013, the maximum ozone concentrations in the Basin continued to exceed federal standards by wide margins. The maximum one-hour ozone concentration was 0.151 ppm and the maximum eight-hour ozone concentration was 0.122 ppm; both were recorded in the Central San Bernardino Valley 1 area. The federal one-hour ozone standard was revoked and replaced by the eight-hour average ozone standard effective June 15, 2005. Effective May 27, 2008, the USEPA revised the federal eight-hour ozone standard from 0.84 ppm to 0.075 ppm. The maximum eight-hour concentration was 163 percent of the current federal standard. The maximum one-hour concentration was 168 percent of the one-hour state ozone standard of 0.09 ppm. The maximum eight-hour concentration was 174 percent of the eight-hour state ozone standard of 0.070 ppm.

<u>Nitrogen Dioxide</u>

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 2013, NO2 concentrations were monitored at 26 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 U.S.

In 2013, the maximum annual average concentration was 22.5 parts per billion (ppb) recorded in the Pomona/Walnut Valley area. Effective March 20, 2008, CARB revised the nitrogen dioxide one-hour standard from 0.25 ppm (250 ppb) to 0.18 ppm (180 ppb) and established a new annual standard of 0.030 ppm (30 ppb). In addition, USEPA has established a new federal one-hour NO2 standard of 100 ppb (98th percentile concentration), effective April 7, 2010. The highest one-hour maximum concentration recorded in 2013 (90.3 ppb in Central Los Angeles County area) was 50 percent of the state one-hour standard. The highest one-hour 98th percentile concentration, recorded in 2013 (71.3 ppb in the South Coastal Los Angeles County area near the ports of Los Angeles and Long Beach), was 40 percent of the state one-hour standard and 71 percent of the federal one-hour standard. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations.

Sulfur Dioxide

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 SO2 occurred in 2013 at any of the eight monitoring locations. The maximum one-hour SO2 concentration was 21.8 ppb, as recorded in the South Coastal Los Angeles County 1 area. The USEPA revised the federal sulfur dioxide standard by establishing a new one-hour standard of 0.075 ppm (75 ppb) 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 (250 ppb) for the one-hour average and 0.04 ppm (40 ppb) for the 24-hour average. Though SO2 concentrations remain well below the standards, SO2 is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. Because historical measurements have consistently showed concentrations to be well below standards, monitoring has been limited to locations within the District that may have higher concentrations and higher potential exposures to the pollutant.

<u>Particulate Matter (PM10 and PM2.5)</u>

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 U.S. 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 2013. The federal 24-hour PM10 standard (150 $\mu g/m^3$) was not exceeded at any of the locations monitored in 2013. The federal annual PM10 standard has been revoked, effective 2006. A maximum 24-hour PM10 concentration of 147 $\mu g/m^3$ was recorded in the Mira Loma area and was 98 percent of the federal standard and 294 percent of the much more stringent state 24-hour PM10 standard (50 $\mu g/m^3$). The state 24-hour PM10 standard was exceeded at 17 of the 21 monitoring stations. A maximum annual average PM10 concentration of 41.1 $\mu g/m^3$ was recorded in Mira Loma. The maximum annual average PM10 concentration in Mira Loma was 206 percent of the state standard of 20 $\mu g/m^3$. The USEPA published approval of SCAQMD's PM10 request for redesignation for attainment on June 26, 2013, with an implementation date of July 26, 2013.

In 2013, PM2.5 concentrations were monitored at 20 locations throughout the district. USEPA revised the federal 24-hour PM2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$, effective December 17, 2006, and retained the form of the standard using the 98th percentile each year, averaged over three years. In 2013, the 98th percentile PM2.5 concentrations in the Basin exceeded the current federal 24-hour PM2.5 standard in two of the 20 locations. A 98th percentile 24-hour PM2.5 concentration of 37.5 $\mu g/m^3$ was recorded in the Metropolitan Riverside County 1 area, which represents 107 percent of the federal standard of 35 $\mu g/m^3$. Further, in July 2015, SCAQMD staff submitted a letter to EPA requesting a change in its attainment status to 'Serious' non-attainment due to high 24-hour concentrations of PM2.5 persisting through 2015. A maximum annual average PM2.5 concentration of 14.12 $\mu g/m^3$ was recorded in Mira Loma, which represents 118 percent of both the federal and state standard of 12 $\mu g/m^3$.

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 and the East San Gabriel Valley. 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.

<u>Lead</u>

Under the federal Clean Air Act, lead is classified as a "criteria pollutant." Lead has observed adverse health effects at ambient concentrations. Lead is also deemed a carcinogenic toxic air contaminant (TAC) by the Office of Environmental Health Hazard Assessment (OEHHA). The USEPA has thoroughly reviewed the lead exposure and health effects research, and has prepared substantial documentation in the form of a Criteria Document to support the selection of the 2008 NAAQS for lead. The Criteria Document used for the development of the 2008 NAAQS for lead states that studies and evidence strongly substantiate that blood lead levels in a range of 5-10 µg/dL, or possibly lower, could likely result in neurocognitive effects in children. The report further states that "there is no level of lead exposure that can yet be identified with confidence, as clearly not being associated with some risk of deleterious health effects[5]."

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

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5 Environmental Protection Agency, Office of Research and Development, "Air Quality Criteria Document for Lead, Volumes I-II," October 2006.

associated with increased blood pressure. Chronic health effects include nervous and reproductive system disorders, neurological and respiratory damage, cognitive and behavioral changes, and hypertension. Exposure to lead can also potentially increase the risk of contracting cancer or result in other adverse health effects. Lead has been classified as a probable human carcinogen by the International Agency for Research on Cancer, based mainly on sufficient animal evidence, and as reasonably anticipated to be a human carcinogen by the U.S. National Toxicology Program. Young children are especially susceptible to the effects of environmental lead because their bodies accumulate lead more readily than do those of adults, and because they are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ.

Lead poisoning can cause anemia, lethargy, seizures, and death. 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.

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

As a result, the federal and current state standards for lead were not exceeded in any area of the district in 2013. 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 fuels.

On November 12, 2008, USEPA published new NAAQS for lead, which became effective January 12, 2010. The existing national lead standard, 1.5 $\mu g/m^3$, was reduced to 0.15 $\mu g/m^3$, averaged over a rolling three-month period.

The maximum 3-month rolling average lead concentration (0.011 $\mu g/m^3$ was recorded at monitoring stations in Central Los Angeles, South San Gabriel Valley, and South Central LA County areas) was seven percent of the federal 3-month rolling lead standard (0.15 $\mu g/m^3$). The maximum monthly average lead concentration (0.014 $\mu g/m^3$ in South Central Los Angeles County area), measured at special monitoring sites immediately adjacent to stationary sources of lead was 0.9 percent of the state monthly average lead standard (1.5 $\mu g/m^3$). No lead data were obtained at SSAB and Orange County stations in 2013. Because historical lead data showed concentrations in SSAB and Orange County areas to be well below the standard, measurements have been discontinued at these locations.

In 2010, a portion of Los Angeles County was designated as not attaining the NAAQS of 0.15 $\mu g/m^3$ for lead based on monitored air quality data from 2007 to 2009 that indicated a violation of the NAAQS near and due to one of two large lead-acid battery recycling facilities in the District. However, the new federal standard was not exceeded at any source/receptor location the following year (in 2011).

Nevertheless, based on the monitored emissions from the two battery recycling facilities, USEPA designated the Los Angeles County portion of the Basin as non-attainment for the new lead standard, effective December 31, 2010. 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.

In response to the nonattainment designation, the State submitted the *Final 2012 Lead State Implementation Plan – Los Angeles County* (2012 Lead SIP) to the USEPA on June 20, 2012. The plan outlines steps that will bring the area into attainment with the federal lead standard before December 31, 2015. As of February 11, 2014, the USEPA announced in the Federal Register (FR) final approval of the lead air quality plan, to be effective 30 days after publication (e.g., March 12, 2014).

In 2013, higher lead concentrations continued to be recorded at source-oriented monitoring sites immediately downwind of stationary lead sources. The maximum monthly and 3-month rolling averages recorded in 2013 were 0.14 $\mu g/m^3$ and 0.10 $\mu g/m^3$, respectively.

In May 2014, the USEPA released its "Policy Assessment for the Review of the Lead National Ambient Air Quality Standards," reaffirming the primary (health-based) and secondary (welfare-based) staff conclusions regarding whether to retain the current standards. In January 2015, the USEPA announced that the ambient lead concentration standard of 0.15 $\mu g/m^3$ averaged over a rolling 3-month period would remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the USEPA.

To continue to pursue reducing lead emissions from large lead-acid battery recycling facilities, in March 2015, Rule 1420.1 was amended to further lower the ambient lead concentration limit to 0.120 $\mu g/m^3$ effective January 1, 2016 and 0.100 $\mu g/m^3$ effective January 1, 2017 and the point source lead emission rate to 0.023 pounds per hour, as well as adding additional housekeeping and maintenance requirements.

On April 7, 2015, the larger of the two lead-acid battery recycling facilities withdrew its California Department of Toxic Substance Control (DTSC) permit application and provided notification of its intent to permanently close.

While Rule 1420.1 will be effective in reducing emissions from the large lead-acid battery recycling industry, lead emissions from the broader industry source category of metal melting is still a concern because the metal melting industry is the most significant stationary source of reported lead emissions. While existing federal and state regulations currently control lead emissions from the metal melting industry, additional requirements similar to those that have effectively reduced emissions from large lead-acid battery recyclers are also necessary to adequately protect public health by minimizing public exposure to lead emissions and preventing exceedances of the lead NAAQS in the Basin. As a result, the SCAQMD is proposing to adopt Rule 1420.2 – Emission Standards for Lead from Metal Melting Facilities which is scheduled to be considered by the SCAQMD Governing Board at its September 4, 2015 public hearing.

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 2013, the state 24-hour sulfate standard (25 $\mu g/m^3$) was not exceeded in any of the monitoring locations in the district. There is no federal sulfate standard.

Hydrogen Sulfide

Hydrogen Sulfide (H2S) is a colorless gas with the characteristic foul odor of rotten eggs. H2S is heavier than air, very poisonous, corrosive, flammable, and explosive. H2S is naturally occurring in crude oil and natural gas, but H2S can also be created from the bacterial breakdown of organic matter in the absence of oxygen (e.g., in swamps and sewers). For example, on September 9, 2012, a thunderstorm over the Salton Sea caused odors to be released across the Coachella Valley. The SCAQMD received over 235 complaints of sulfur and rotten egg type odors in response to this natural event. Air samples were taken at several locations around the Salton Sea area to confirm source of odors and results of sampling showed total sulfur gas concentration of 149 ppb. The State air quality standard for H2S is 30 ppb, averaged over one-hour, and the odor threshold for H2S is approximately eight ppb. In response to potential for increasing odor complaints in the future, in October 2013, the SCAQMD installed two H2S monitors in the Coachella Valley to monitor the presence of H2S during odor events at the Salton Sea. The monitors are located at Saul Martinez Elementary School in Mecca and on the Torres Martinez Desert Cahuilla Indian Tribal land near the north end of the Salton Sea.

Vinyl Chloride

Vinyl chloride is a colorless, flammable gas at ambient temperature and pressure. It is also highly toxic and is classified as a carcinogen by the state Office of Environmental Health Hazard Assessment (OEHHA), in addition to the designations by the American Conference of Governmental Industrial Hygienists (confirmed carcinogen in humans) and by the International Agency for Research on Cancer (known to be a human carcinogen). 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 the 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 – Control of Gaseous Emissions from Municipal Solid Waste Landfills, 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.

Volatile Organic Compounds

It should be noted that there are no state or national ambient air quality standards for volatile organic compounds (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 O3, which is a criteria pollutant. 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.

Visibility

In 2005, annual average visibility at Rubidoux (Riverside), the worst case, was just over 10 miles. 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 3.2-1. 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.

Federal Regional Haze Rule: The federal Regional Haze Rule, established by the USEPA pursuant to CAA §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). USEPA's visibility regulations (40 CFR Parts 51.300 - 51.309), require states to develop measures necessary to make reasonable progress towards remedying visibility impairment in these federal Class I areas. CAA §169A and USEPA's visibility regulations also require Best Available Retrofit Technology (BART) for certain large stationary sources that were put in place between 1962 and 1977. (See Regional Haze Regulations and Guidelines for BART Determinations, 70 FR 39104, July 6, 2005).

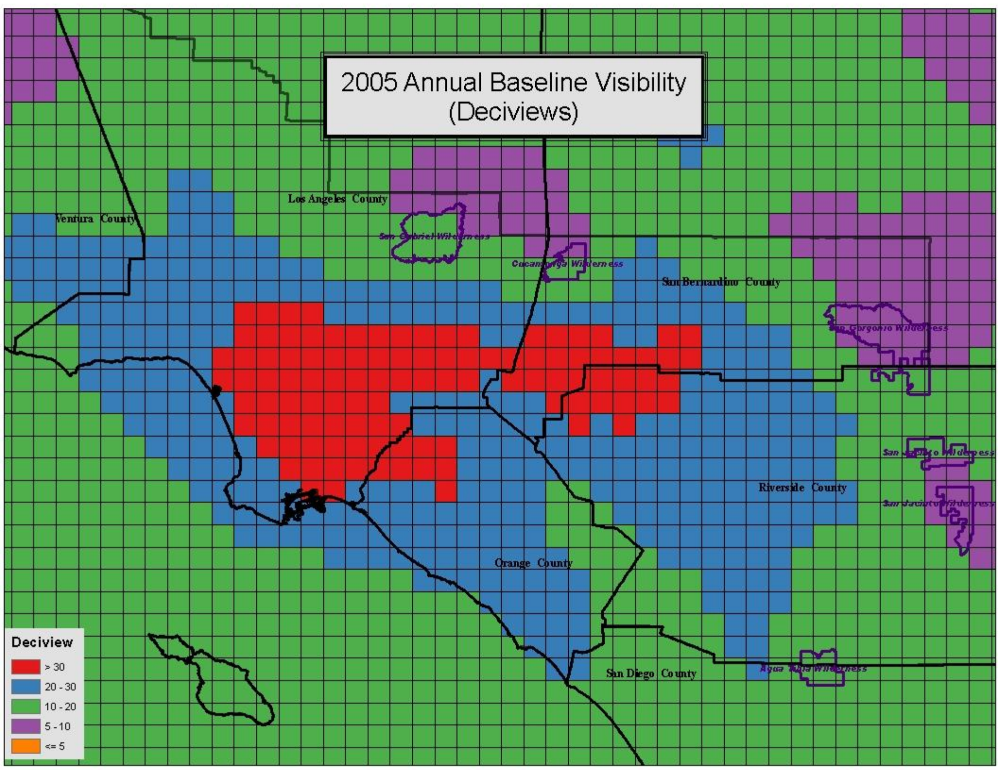

FIGURE 3.2-1
2005 Annual Baseline Visibility

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 NO2 concentrations as a result of 2007 AQMP controls.

To meet Federal Regional Haze Rule requirements, CARB adopted the California Regional Haze Plan on January 22, 2009, addressing California's visibility goals through 2018. As shown in Table 3.2-1, 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

Federal

Under the CAA §112, the USEPA 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 USEPA 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 USEPA 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 already controlled by state-mandated air toxics control measures or by local district rules, many of the sources that would have been subject to federal requirements already comply.

In addition to the major source NESHAPs, USEPA has also controlled HAPs from urban areas by developing Area Source NESHAPs under their Urban Air Toxics Strategy. USEPA 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 USEPA to identify a list of at least 30 air toxics that pose the greatest potential health threat in urban areas. USEPA 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. USEPA has identified a total of 70 area source categories with regulations promulgated for more than 30 categories so far.

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 (TACs). 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.

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 (TAC) Identification and Control Act, Assembly Bill (AB) 1807, Tanner. Under the state program, TACs 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.

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 air toxic control measures (ATCMs) are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 187 federal HAPs as TACs.

ATCMs are developed by CARB and implemented by the SCAQMD and other air districts through direct implementation or 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.

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.

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.

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.

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 SCAQMD Rule 461 – Gasoline Transfer and Dispensing, which reduces benzene emissions from gasoline dispensing and SCAQMD Rule 1124 – Aerospace Assembly and Component Manufacturing Operations, which reduces perchloroethylene, trichloroethylene, and methylene chloride emissions from aerospace operations.

New and modified sources of TACs in the district are subject to SCAQMD Rule 1401 - New Source Review of Toxic Air Contaminants and SCAQMD 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. Rule 1401 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 one of the most substantial amendments to the rule. SCAQMD Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools, 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.

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 TACs. 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 TACs in the district implemented between years 2000 and 2010 through cooperative efforts of the SCAQMD, local governments, CARB and USEPA.

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 (see next section). 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:

- SCAQMD Rule 1401.1 - Requirements for New and Relocated Facilities Near Schools. which set more stringent health risk requirements for new and relocated facilities near schools
- SCAQMD Rule 1470 – Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines, which established diesel PM emission limits and other requirements for diesel-fueled engines
- SCAQMD Rule 1469.1 – Spraying Operations Using Coatings Containing Chromium, which regulated chrome spraying operations
- SCAQMD Rule 410 – Odors From Transfer Stations and Material Recovery Facilities, 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

2004 Addendum to the ATCP: An addendum to the ATCP was adopted by the SCAQMD Governing Board in 2004 (referred to herein as the 2004 Addendum to the ATCP) 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 2004 Addendum to the ATCP 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 to the ATCP. CARB has also made notable progress in mobile source measures via its Diesel Risk Reduction Plan, especially for goods movement related sources, while the USEPA continued to implement their air toxic programs applicable to stationary sources

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.

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 (MICR): greater than 10 in one million (10×10^{-6})
- Total Hazard Index (HI): 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 SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources. 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.

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.

- CalEPA 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 TACs from warehousing facilities.

Environmental Justice: Environmental justice (EJ) has long been a focus of the SCAQMD. In 1990, the SCAQMD formed an Ethnic Community Advisory Group that has since been 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 in 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 ATCP and the 2004 Addendum to the ATCP. 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).

AB 2766 Subvention Funds: AB2766 subvention funds are monies collected by the state as part of vehicle registration and passed through to the SCAQMD for funding projects of local cities, among others, 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.

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.

Control of TACs with Risk Reduction Audits and Plans: 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 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.

Multiple Air Toxics Exposure Studies (MATES): 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. TACs are determined by the USEPA, and by the CalEPA, 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 TACs (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 TACs, 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, 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 declined by 50 percent from the MATES II values.

Multiple Air Toxics Exposure Study IV (MATES IV): Monitoring began in June 2012 and a Technical Advisory Group formed. The 10 sites from Mates III would continue to be monitored for trends in the data. A new focus of Mates IV is the inclusion of measurements of ultrafine particle concentrations and localized impacts of combustion sources. The focus of these measurements will be on assessing the exposures to ultrafine particles and black carbon very near sources such as airports, freeways, railyards, busy intersections and warehouse operations.

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 U.S. is attributable to cancer. About two percent of cancer deaths in the U.S. 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.

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. CalEPA'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 include burning coal, oil, gasoline, 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 has been identified as 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.

Federal

Greenhouse Gas Endangerment Findings: On December 7, 2009, the USEPA Administrator signed two distinct findings regarding greenhouse gases pursuant to CAA §202 (a). 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 USEPA 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.

Renewable Fuel Standard: The Renewable Fuel Standard (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 USEPA 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[6], 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.

GHG Tailoring Rule: On May 13, 2010, USEPA finalized the GHG Tailoring Rule to phase in the applicability of the Prevention of Significant Deterioration (PSD) and Title V operating permit programs for GHGs. The GHG Tailoring Rule was tailored to include the largest GHG emitters, while excluding smaller sources (restaurants, commercial facilities and small farms). The first phase (from 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 CO2 equivalent emissions (CO2e) per year or more.

The second phase (from 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 metric 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 metric 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 metric tons of CO2e per year or more would be emitted.

[6] One metric ton is equal to 2, 205 pounds.

The third phase of the GHG Tailoring Rule, finalized on July 12, 2012, determined not to lower the current PSD and Title V applicability thresholds for GHG-emitting sources established in the GHG Tailoring Rule for phases 1 and 2. The GHG Tailoring Rule also promulgated 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.

GHG Reporting Program: USEPA 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 CO2 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 as CO2e are required to submit annual reports to USEPA. For the 2010 calendar, there were 6,260 entities that reported GHG data under this program, and 467 of the entities were from California. Of the 3,200 million metric tons of CO2e that were reported nationally, 112 million metric tons of CO2e 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 CH4 with four percent, and N2O and fluorinated gases representing the remaining one percent.

<u>State</u>

Executive Order S-3-05: In June 2005, 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.

AB 32 - Global Warming Solutions Act: On September 27, 2006, AB 32, the California Global Warming Solutions Act of 2006, was signed by Governor Schwarzenegger. AB 32 expanded on Executive Order S-3-05. The California 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 U.S. 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 a GHG emissions reduction plan by January 1, 2009, indicating how the GHG 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 GHG 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 GHG 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 (LCFS); and
- Targeted fees, including a public good charge on water use, fees on high global warming potential (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.

SB 97 – CEQA, Greenhouse Gas Emissions: On August 24, 2007, Governor Schwarzenegger signed into law SB 97 – CEQA: Greenhouse Gas Emissions, and stated, "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." As directed by SB 97, the Natural Resources Agency adopted amendments to the CEQA Guidelines for GHG emissions on December 30, 2009 to provide 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.

***OPR - 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 CalEPA, 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 CO2e (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 substance (ODS) substitutes saw the highest increase (52 percent).

From a broader geographical perspective, the state of California ranked second in the U.S. 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.

AB 1493 Vehicular Emissions - CO2: Prior to the USEPA and NHTSA joint rulemaking, Governor Schwarzenegger 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 (see amendments to CCR Title 13 §§1900 and 1961 (13 CCR 1900, 1961), and the adoption of CCR Title 13 §1961.1 (13 CCR 1961.1)). California's first request to the USEPA to implement GHG standards for passenger vehicles was made in December 2005 and subsequently denied by the USEPA in March 2008. The USEPA 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, 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.

SB 1368: SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the CPUC to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The CEC was also required to 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 required that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Executive Order S-1-07: Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which established the transportation sector as the main source of GHG emissions in California. Executive Order S-1-07 proclaims that the transportation sector accounts for over 40 percent of statewide GHG emissions. Executive Order S-1-07 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, Executive Order S-1-07 established the LCFS and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, CARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. The analysis supporting development of the protocols was included in the SIP 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.

SB 375: SB 375, signed into law 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 four 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 CARB 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 was required to adopt final targets by September 30, 2010.

Executive Order S-13-08: Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directed California to develop methods for adapting to climate change through preparation of a statewide plan. Executive Order S-13-08 directed 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. Executive Order S-13-08 also directed 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 was 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.

SB 1078, SB 107 and Executive Order S-14-08: 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, Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020.

SB X-1-2: SB X1-2 was signed by Governor Brown in April 2011. SB X1-2 created a new Renewables Portfolio Standard (RPS), which pre-empted 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.

<u>SCAQMD</u>

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 GHG emission reduction goal.

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 SCAQMD Regulation XX - 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 3.2-3 presents the GHG emission inventory by major source categories in calendar year 2008, as identified in the 2012 AQMP for the South Coast Air 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: CO2, N2O, and CH4. These GHG emissions are reported in MMTCO2e. Mobile sources generate 59.4 percent of the emissions, and include airport equipment, and 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 such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which are considered ODSs. The Montreal Protocol was first signed in September 16, 1987 and has been revised seven times. The U.S. ratified the original Montreal Protocol and each of its revisions.

<u>Federal</u>

Under the CAA Title VI, the USEPA is assigned responsibility for implementing programs that protect the stratospheric ozone layer. 40 CFR Part 82 contains USEPA's regulations specific to protecting the ozone layer. These USEPA regulations phase out the production and import of ozone depleting substances (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 HCFCs, which are transitional substitutes for many Class I substances and are being phased out.

TABLE 3.2-3
2008 GHG Emissions for the South Coast Air 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 3.2-3 (Continued)
2008 GHG Emissions for the South Coast Air Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	**Source Category**	**CO2**	**N2O**	**CH4**	**CO2**	**N2O**	**CH4**	**CO2e**
	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 3.2-3 (Concluded)
2008 GHG Emissions for the South Coast Air Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	**Source Category**	**CO2**	**N2O**	**CH4**	**CO2**	**N2O**	**CH4**	**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**

<u>State</u>

AB 32 - Global Warming Solutions Act: Some ODSs exhibit high global warming potentials. CARB 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.

Refrigerant Management Program: As part implementing AB 32, CARB also adopted a Refrigerant Management Program in 2009. The Refrigerant Management Program is designed 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.

HFC Emission Reduction Measures for Mobile Air Conditioning - Regulation for Small Containers of Automotive Refrigerant: The Regulation for Small Containers of Automotive Refrigerant 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.

<u>SCAQMD</u>

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy targeted a transition away from 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 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 HCFCs by the year 2000;
- develop recycling regulations for HCFCs; and
- develop an emissions inventory and control strategy for methyl bromide.

SCAQMD Rule 1122 – Solvent Degreasers: SCAQMD Rule 1122 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 VOCs or with a NESHAP halogenated solvent. Some ODSs such as carbon tetrachloride and TCA are NESHAP halogenated solvents.

SCAQMD Rule 1171 – Solvent Cleaning Operations: SCAQMD Rule 1171 reduces emissions of VOCs, TACs, and stratospheric ozone-depleting or globalwarming compounds from the use, storage and disposal of solvent cleaning materials in solvent cleaning operations and activities

SCAQMD 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.

SCAQMD 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.

SCAQMD 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 subchapter describes existing regulatory setting relative energy production and demand, including alternative and renewable fuels, and trends within California and the SCAQMD.

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 (USDOT), United States Department of Energy (USDOE), and United States Environmental Protection Agency (USEPA) 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

<u>Energy Policy and Conservation Act</u>

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 USDOT, 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 USEPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The USEPA 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.

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) 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.

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

The Public Utility Regulatory Policies Act of 1978 (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 the 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).

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.

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.

Clean Air Act

The Clean Air Act (CAA), §211 (o), as amended by the Energy Policy Act of 2005, requires the Administrator of the U.S. Environmental Protection Agency (USEPA) 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 FR 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 CAA 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 CAA.

Corporate Average Fuel Economy 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 Corporate Average Fuel Economy (CAFE) program, which is administered by the USEPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The USEPA 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.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act (EISA) of 2007 was signed into law by President George W. 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 EISA requires 36 billion gallons of ethanol per year by 2022, with corn-based ethanol limited to 15 billion gallons. The new CAFE standard for light duty vehicles is 35 miles per gallon by 2020. EISA also specifies that vehicle attribute-based standards are to be developed separately for cars and light trucks. EISA 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.

California Building Energy Efficiency Standards

California established statewide building energy efficiency standards in CCR, Title 24 - California Building Standards Code in response to a legislative mandate to reduce California's energy consumption. Title 24 contains the regulations that govern the construction of buildings in California. 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 standards are updated approximately every three years by the CEC to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2005 Building Energy Efficiency Standards were first adopted in November 2003, and took effect October 1, 2005. Subsequently the standards have undergone two updates, one in 2008 and one in 2013. The 2013 Building Energy Efficiency Standards will go into effect on July 1, 2014.

AB 1007 - Alternative Fuels Plan

AB 1007 (Pavley, Chapter 371, Statutes of 2005) requires the CEC to prepare an Alternative Fuels Plan for the state to increase the use of alternative fuels in California. The CEC prepared the plan in partnership with CARB, and in consultation with 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.

AB 1493 - Vehicle Climate Change Standards

AB 1493 required California 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 that were designed to improve fuel efficiency were adopted by CARB in September 2004.

SB 1368 - Emission Performance Standards

On September 29, 2006, Governor Schwarzenegger signed into law SB 1368 – Emissions Performance Standards (Perata, Chapter 598, Statutes of 2006). SB 1368 limits long-term investments in baseload generation by California's utilities to power plants that meet an emissions performance standard (EPS) jointly established by the CEC and the CPUC. SB 1368 establishes a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 lbs CO2 per MWh to encourage the development of power plants that meet California's growing energy needs while minimizing their emissions of greenhouse gases.

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 and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas and Electric (SDG&E). The CSI 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.

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.

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 in September 2002 by Governor Davis. The CEC and the CPUC are jointly implementing the standard. In 2006, RPS was modified by SB 107 to require retail sellers of electricity to reach the 20 percent renewables goal by 2010. In 2011, RPS was further modified by SB 2 to require retailers to reach 33 percent renewable energy by 2020.

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 (or equivalent documents) that are prepared pursuant to CEQA. Energy conservation is described in Appendix F of CEQA Guidelines 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 (or equivalent documents) 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

Clean Cities Program

The USDOE 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 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.

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. In 2012, the electricity generated in-state totaled 199,101 gigawatt hours (GWh)[1] while imported electricity totaled 102,866 GWh, with 39,470 GWh coming from the Pacific Northwest, and 63,396 GWh coming from the Southwest (CEC, 2013e)[2]. For natural gas in 2012, 35 percent came from the Southwest, 16 percent came from Canada, nine percent came from in-state, and 40 percent came from the Rocky Mountains (CEC, 2013c)[3]. Also in 2013, 37 percent of the crude oil came from in-state, with 12 percent coming from Alaska, and 51 percent being supplied by foreign sources (CEC, 2011a)[4].

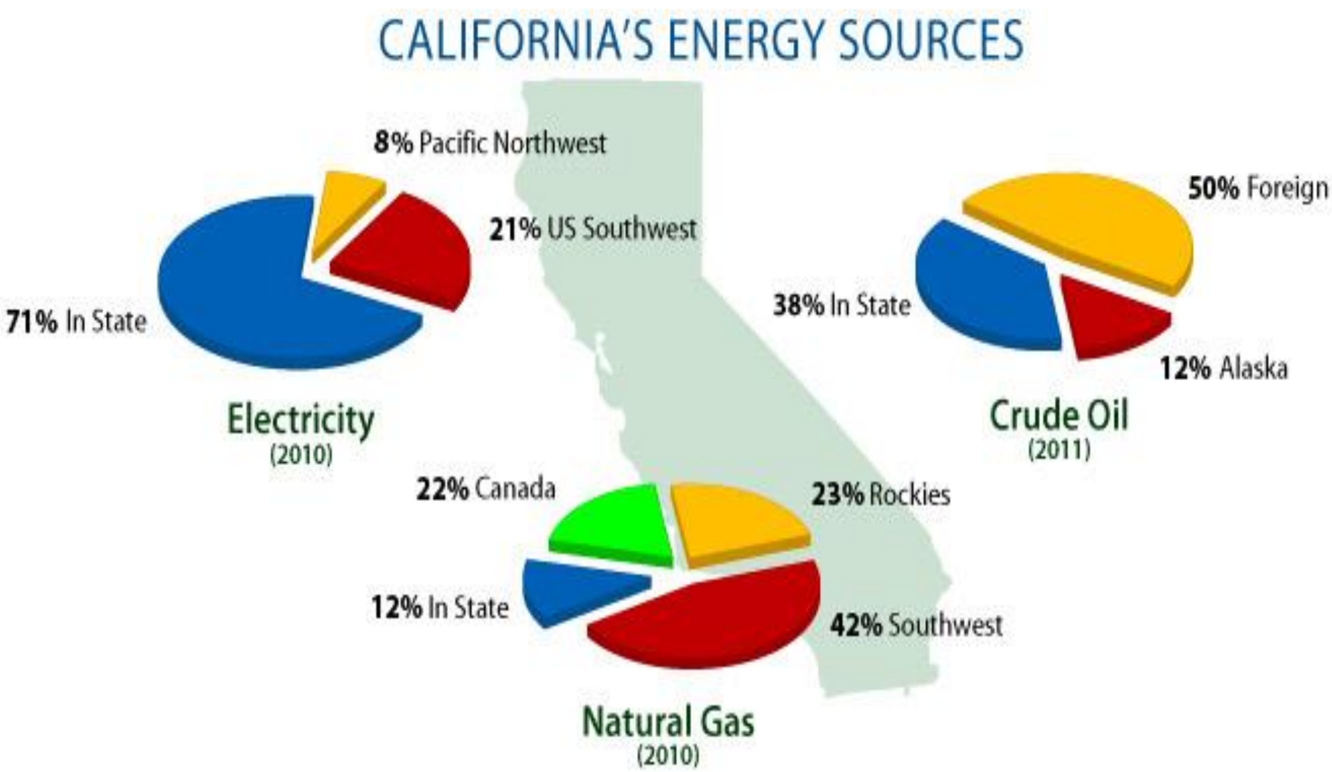

FIGURE 3.3-1
California's Major Sources of Energy[5]

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[1] One gigawatt is equal to one million kilowatts.
[2] Total Electricity System Power, Total System Power for 2013: Changes From 2012; CEC Energy Almanac. http://energyalmanac.ca.gov/electricity/total_system_power.html
[3] Natural Gas Supply By Region, CEC Energy Almanac. http://energyalmanac.ca.gov/naturalgas/natural_gas_supply.html.
[4] Oil Supply Sources to California Refineries, CEC Energy Almanac http://energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts.html.
[5] California's Major Sources of Energy, CEC Energy Almanac, last updated April 7, 2011. http://energyalmanac.ca.gov/overview/energy_sources.html.

3.3.2.1 Electricity

Power plants in California provided approximately 66 percent of the total in-state electricity demand in 2012 of which 17 percent came from renewable sources such as biomass, geothermal, small hydro, solar, and wind. The Pacific Northwest provided another 13 percent of the total electricity demand of which 24 percent came from renewable sources. The Southwest provided 21 percent of the total electricity demand, with five percent coming from renewable sources. In total, 15.4 percent of the total in-state electricity demand for 2012 came from renewable sources (CEC, 2013e).

Four of the state's largest power plants are located in Basin (CEC, 2014e)[6]. The largest power plants in California are located in northern California: the Moss Landing Natural Gas Power Plant (2,484 megawatts (MW)) is located in Monterey Bay in Monterey County and the Diablo Canyon Nuclear Plant (2,323 MW) is located in Avila Beach in San Luis Obispo County. The third and fourth largest power plants in California are located inside the Basin: the AES Alamitos Natural Gas Power Generating Station (1,970 MW) in Long Beach in Los Angeles County and Haynes Natural Gas Power Plant (net summer capacity 1,724 MW) in Long Beach. The fifth and sixth largest power plants in California are located outside of the Basin: the Ormond Beach Natural Gas Power Plant (1,613 MW) in City of Oxnard within Ventura County and Pittsburg Natural Gas Power Plant (1,370 MW) in the City of Pittsburg within Contra Costa County. The LADWP operates the state's seventh and eighth largest power plants: the AES Redondo Beach Natural Gas Power Plant (1,343 MW) in Redondo Beach and the Castaic Pump-Storage Power Plant[7] in Castaic (1,331 MW). The ninth and tenth largest power plants in California are also located outside of the Basin: the Helms Pumped Storage Facility (1,212 MW) in Sierra National Forest of Fresno County and La Paloma Generating Project (1,200 MW) in West Elk Hills within Kern County.

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 LADWP and the Imperial Irrigation District. The 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. The SCE delivers 78 percent of the retail electricity sales to residents and businesses in southern California. The SDG&E provides local distribution service to the southern portion of Orange County (SCAG, 2012)[8].

The LADWP is the largest of the publicly owned electric utilities in southern California. The 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,

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6 California Power Plant Database; CEC; accessed August 2014. http://energyalmanac.ca.gov/powerplants/Power_Plants.xlsx

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

8 Draft Program Environmental Impact Report for the 2012 – 2035 RTP/SCS; SCAG; December 2011. http://rtpscs.scag.ca.gov/Pages/Draft-2012-PEIR.aspx

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.

TABLE 3.3-1

2013 Electricity Use in GWh (Aggregated, includes self generation and renewables)

Sector	Los Angeles	Orange	Riverside	San Bernardino	Total
Ag & Water Pump	3,113	278	640	513	4,545
Commercial	27,468	9,569	5,896	5,098	48,031
Industry	12,510	2,411	1,254	2,945	19,121
Mining	1,475	385	148	214	2,222
Residential	19,456	6,301	6,125	4,227	36,109
Streetlight	309	102	61	70	542
TCU	3,761	975	561	1,056	6,354
Total	68,093	20,022	14,685	14,124	116,923

Source: CEC –email sent by Steven Mac on August 29, 2014.

3.3.2.2 Natural Gas

Four regions supply California with natural gas: California, the Southwest, the Rocky Mountains, and Canada. The Southwest, the Rocky Mountains, and Canada combined supplied 91 percent of all the natural gas consumed in California in 2012. The remainder is produced in California (CEC, 2013c).

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 and Oil Department (LBGOD) is municipally owned and operated by the City of Long Beach, providing gas service to approximately 500,000 residents and businesses in the cities of Long Beach and Signal Hill (LBGOD, 2014)[9]. The SDG&E 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).

9 Welcome to the Long Beach Gas & Oil Department. Long Beach Gas & Oil Department (LBGOD); accessed August 2014. http://admin.longbeach.gov/lbgo/default.asp

In 2012, about 50 percent of the natural gas consumed in California was for electric generation purposes (801,345 million cubic feet) (USEIA, 2012)[10]. Table 3.3-2 provides the estimated use of natural gas in California by residential, commercial and industrial sectors.

TABLE 3.3-2
California Natural Gas Demand 2014
(Million Cubic Feet per Day – MMcf/day)

Sector	Utility	Non-Utility	Total
Residential	1,218	--	1,218
Commercial	505	--	505
Natural Gas Vehicles	43	--	43
Industrial	934	--	934
Electric Generation	2,026	466	2,492
Enhanced Oil Recovery (EOR) Steaming	44	497	541
Wholesale / International + Exchange	235	--	235
Company Use and Unaccounted-for	80	--	80
EOR Cogeneration / Industrial	--	128	128
Total	**5,085**	**1,090**	**6,175**

Totals may not equal sum of components due to independent rounding.
Source: 2014 California Gas Report. http://www.pge.com/pipeline/library/regulatory/downloads/cgr14.pdf

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).

As of April 2014, California is currently ranked third among the oil producing states, behind Texas and North Dakota, respectively (USEIA, 2014a)[11]. California also ranked third in the

[10] Table 5.12 - Consumption of Natural Gas for Electricity Generation by State, by Sector, 2012; U.S. Energy Information Administration (USEIA); accessed August 2014. http://www.eia.gov/electricity/annual/html/epa_05_12.html

[11] U.S. States, State Profiles and Energy Estimates, Rankings: Crude Oil Production; May 2014, USEIA, accessed August 2014. http://www.eia.gov/state/rankings/?sid=US&CFID=16318874&CFTOKEN=ae573cdc61654233-EE9BD34F-25B3-1C83-54586F32B366D836&jsessionid=8430a691f97d1894bc33d35305b7d1c231a9#/series/46

nation in refining capacity as of January 2014, with a combined capacity of almost two million barrels per calendar day from its 18 operable refineries (USEIA, 2014b)[12].

California also ranked first in the consumption of petroleum products used by the transportation sector (USEIA, 2012a)[13]. 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 fiscal year 2013, 14,443,650,668 gallons of gasoline[14] and 2,637,184,371 gallons of diesel fuel[15] were sold in California (California State Board of Equalization, 2013). The volume of gasoline also includes aviation fuel. In 2012, 14,480 million gallons of gasoline and 1,587 million gallons of diesel were sold by retail facilities throughout California. Retail 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 the four counties within SCAQMD's jurisdiction are presented in Table 3.3.-3.

TABLE 3.3-3
Retail Motor Fuel Sales in California by County (CEC, 2012i)[16]
(millions of gallons per year)

Description	California	Los Angeles	Orange	Riverside	San Bernardino
Gasoline [a]	14,486	3,451	1,355	895	878
Diesel [b]	1,587	244	46	107	188

[a] 2012 California Retail Gasoline Sales by County; CEC; http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_gasoline_sales_by_county.html
[b] 2012 California Retail Diesel Sales by County; CEC; http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_diesel_sales_by_county.html

3.3.3 Alternative Clean Transportation Fuels

The demand for transportation fuels in California is increasing at a rapid rate and is projected to grow by almost 35 percent over the next 20 years. Unless habits change, petroleum will be the

12 California State Profile and Energy Estimates, Quick Facts; USEIA; accessed August 2014. http://www.eia.gov/state/?sid=CA&CFID=16957926&CFTOKEN=f27a8712ad923a0a-6D522B58-237D-DA68-24E25846F72A3365&jsessionid=84301d78ae226ef8ee07326b113a3b1a7331

13 Table F15: Total Petroleum Consumption Estimates, 2012; USEIA; accessed August 2014. http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US&sid=CA

14 Taxable Gasoline Gallons 10 Year Report; 2013 data; California State Board of Equalization; Fuel Taxes Statistics & Reports, Motor Vehicle Fuel; accessed August 2014. http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf

15 Taxable Diesel Gallons 10 Year Report; 2013 data; California State Board of Equalization; Fuel Taxes Statistics & Reports, Motor Vehicle Fuel; accessed August 2014. http://www.boe.ca.gov/sptaxprog/reports/Diesel_10_Year_Report.pdf

16 Retail Fuel Report and Data for California; CEC; accessed August 2014. http://energyalmanac.ca.gov/gasoline/piira_retail_survey.html

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)[17].

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 USDOE 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 USDOE, 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)[18].

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 has rebounded as refiners and other obligated parties strive to meet biodiesel blending requirements mandated by the RFS. According to the CEC, at least a sixfold increase in biodiesel production to 188 million

[17] Consumer Energy Center, 2012. Alternative Fuel Vehicles, June 2012. http://www.consumerenergycenter.org/transportation/afvs/

[18] Consumer Energy Center, 2012a. Biodiesel as a Transportation Fuel. http://www.consumerenergycenter.org/transportation/afvs/biodiesel.html

gallons per year and renewable diesel production and delivery to more than 300 million gallons per year in California by 2020 (CEC, 2013)[19].

Biodiesel use in California gradually increasing over the past few years in California, but there is a potential constraint in securing enough low-carbon intensity feedstock to produce biodiesel and renewable diesel. The bulk of the renewable diesel is produced in Singapore and shipped to California (CEC, 2013). As such, biodiesel use in California is estimated to have been nearly 136 million gallons in 2013. Table 3.3-4 shows the reported retail sale of biodiesel was 1,673,555 gallons in 2010 (CEC, 2014h)[20]. 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. The combination of RFS requirements for obligated parties, substantial renewable identification number (RIN) credit values, availability of sufficient biofuel resources, and California's LCFS will compel development of low-carbon biofuel projects in the state and shift of low-carbon biofuels to California (CEC, 2013).

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, 2014h

3.3.3.2 Natural Gas

Natural gas is a mixture of hydrocarbons comprised mainly of 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 as compressed natural gas (CNG) or in a liquefied state as liquefied natural gas (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.

[19] 2013 Integrated Energy Policy Report. Transportation Energy Trends. CEC, 2013. http://www.energy.ca.gov/2013_energypolicy/

[20] Retail Biodiesel and E-85 Sales, CEC, Energy Almanac, accessed August 2014. http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_biodiesel+e85_sales.html

With consumption of natural gas vehicles increasing by 26 percent nationwide and 35 percent in California from 2008 to 2013 (U.S. EIA, 2013)[21], and the probability of a sixfold increase in natural gas vehivles and natural gas consumption from 2012 levels by 2020, the fueling infrastructure for natural gas vehicles continues to grow (CEC, 2013). California currently has 281 compressed and 45 liquid natural gas fueling stations. In southern California alone, there are more than 230 natural gas fueling stations in major metropolitan areas from Los Angeles to the Mexican border (USDOE, 2012)[22] .

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 USDOE'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).

As of mid-2013, 32,000 plug-in electric vehicles (PEVs) and an additional 14,000 neighborhood electric vehicles are on the roads. More than 8,000 electric vehicle charge points have been funded by the CEC and the air quality management districts in California. The Governor's ZEV Executive Order[23] and CARB's ZEV mandate, combined with a federal tax credit and incentives for electric vehicle rebates and electric charger installations, are advancing the electric vehicle market penetration in California (CEC, 2013).

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[21] Natural Gas Consumption by End Use, U.S.EIA 2014. http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm

[22] Alternative Fueling Station Locator, U.S. DOE, 2014. http://www.afdc.energy.gov/afdc/locator/stations/state

[23] The Executive Order calls for California to ensure infrastructure is developed to support one million zero-emission vehicles by 2020 and 1.5 million by 2025.

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)[24].

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. Ethanol is also be used in a more pure state as an alternative fuel when the blend is 85 percent ethanol and 15 percent gasoline (E85).

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)[25].

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. As of January 1, 2013, the U.S. fuel ethanol production capacity is reported as nearly 14 billion gallons per year. Since 2009, three of the five existing ethanol facilities in California have begun regular operations. Of the two remaining, one has been shut down and dismantled, and the other is operating intermittently. California uses roughly 1.5 billion gallons of ethanol per year, of which nearly 175 million gallons per year are produced in California and the remainder is imported corn ethanol from the Midwest and foreign sources (CEC, 2013).

As of 2013, there are about 500,000 FFVs operating in California. 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 2009, there were approximately 83 stations that offered E85 to the public. According to the CEC, California nearly sold 6.5 million gallons of E85 in 2012 (CEC, 2013). 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, 2014h). Retail sales do not include E85 that is distributed by commercial fleets,

[24] Transportation Energy Forecasts and Analyses for the 2011 Integrated Energy Policy Report, August 2011. http://www.energy.ca.gov/2011publications/CEC-600-2011-007/CEC-600-2011-007-SD.pdf

[25] Ethanol as a Transportation Fuel, Consumer Energy Center, 2014. http://www.consumerenergycenter.org/transportation/afvs/ethanol.html

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 three billion gallons by 2030 (CEC, 2011).

TABLE 3.3-5
Reported Retail E85 Sales in California in 2010
(gallons per year)

Conventional Fuel Component)	Ethanol Component	Total E85 Throughput	Count of Facilities
299,372	1,696,440	1,995,812	36

Source: CEC, 2012h

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, ethanol imports from Brazil are projected to displace from 250 million to 400 million gallons per year of corn-based ethanol imports because Brazilian sugarcane ethanol is the largest near-term contributor that can achieve the standards mandated by the RFS and LCFS because of its lower carbon intensity value when compared to corn-based ethanol (CEC, 2011).

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.

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, odorless, 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).

As of August 2014, California has 10 public hydrogen fueling stations, 11 private hydrogen fueling stations, and 46 hydrogen fueling stations in development (USDOE, 2014). Without a substantial transportation distribution system in place for hydrogen transportation use, hydrogen could be transported and delivered using the established hydrogen infrastructure. However, for significant market penetration, the infrastructure will need further development (SCAG, 2012).

3.3.3.7 Propane

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 California, the state-wide fleet operated around 13.37 million vehicles that use propane as an alternative fuel (US EIA, 2014)[26]. According to the CEC's survey of retail fuel stations and sales, 805 retail fuel stations sold 25.44 million gallons of propane in 2012 (CEC, 2014i)[27].

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.

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[26] Alternative Fuel Vehicle Data. http://www.eia.gov/renewable/afv/users.cfm#tabs_charts-5

[27] Retail Fuel Report and Data for California. http://energyalmanac.ca.gov/gasoline/piira_retail_survey.html

In 2012, consumption of renewable resources in the United States totaled about nine quadrillion British thermal units (Btu) or about nine percent of all energy used nationally. About 12 percent of U.S. electricity was generated from renewable resources in 2012 (U.S. EIA, 2013a)[28]. In 2012, 20 percent of all electricity came from renewable resources in California (CEC, 2014g)[29].

The 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, 2014g). The quarterly reports report focuses on California's three large investor-owned utilities: PG&E, SCE, and 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 April 1, 2014, the large investor owned utilities reported in their 33% RPS Procurement Progress Reports that they served 20.9 percent of their retail electric load with RPS-eligible generations during the first compliance period (CP 1) from 2011 to 2013 (CEC, 2014g). Table 3.3-6 shows the renewable electricity use in Los Angeles, Orange, Riverside and San Bernardino in 2013.

TABLE 3.3-6
2013 Renewable Electricity Use in the District (in GW)

Sector	Los Angeles	Orange	Riverside	San Bernardino	Total
Ag & Water Pump	6	1	4	1	**12**
Commercial	244	63	85	59	**451**
Industry	8	3	1	6	**18**
Mining	12	1	0	0	**14**
Residential	184	71	104	59	**419**
TCU	5	0	4	16	**25**
Total	**459**	**140**	**198**	**141**	**937**

Source: California Energy Commission –email sent by Steven Mac on August 29, 2014.

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 2013, hydroelectric-produced electricity used by California totaled nearly 27,176 GWh or 9.15 percent of the total system power. In-state production accounted for around 90 percent of all hydroelectricity, while imports from other states totaled 10 percent (CEC, 2013e).

[28] Renewable Energy Explained. http://www.eia.gov/energyexplained/index.cfm?page=renewable_home
[29] Renewables Portfolio Standard: Quarterly Report. http://www.cpuc.ca.gov/NR/rdonlyres/93E7E363-75A6-40C8-997D-705C53A2713D/0/2014Q1RPSReportFINAL.pdf

California has nearly 265[30] hydroelectric facilities with an installed capacity of approximately 13,882 MW[31]. Hydro facilities are divided into two categories with larger than 30 MW capacity facilities (e.g., "large hydro") and smaller than 30 MW capacity facilities (e.g., "small hydro") that 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, 2014f)[32], while total generation increased from 211,028 GWh to 245,535 GWh over the same period of time.

The larger hydro plants located on dams in California (such as Shasta, Folsom, Oroville, etc.) are operated by the U.S. Bureau of Reclamation and the DWR. Small hydro plants are operated by utilities, mainly PG&E and Sacramento Municipal Utility District. The 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 (e.g., from 225 degrees Fahrenheit (°F) to 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 (e.g., from 225 °F to 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 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 (USDOE, 2014a)[33].

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

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30 CEC, 2013a. Annual Generation, August 2014. http://energyalmanac.ca.gov/electricity/web_qfer/Annual_Generation.php
31 CEC, 2013b. Electric Generation Capacity & Energy, August 2014. http://energyalmanac.ca.gov/electricity/electric_generation_capacity.html
32 Overview of Natural Gas in California, 2014. http://www.energyalmanac.ca.gov/naturalgas/overview.html
33 Energy Basics: Geothermal Electricity Production. http://energy.gov/eere/energybasics/articles/geothermal-technology-basics

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. In2013, geothermal energy in California produced 12,485GWh of electricity. Combined with another 707 GWh of imported geothermal electricity, the geothermal energy produced 4.44percent of the state's total system power. A total of 43[34]operating geothermal power plants with an installed capacity of 2,703 MW[35] are in California, about two-thirds of the total United States' geothermal generation (CEC, 2014b).

Direct use systems harness the energy from low to moderate temperature reservoirs (e.g., from 68 °F to 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 that utilizes piping, heat exchangers and controls to deliver 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, 2014b)[36].

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)[37].

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 U.S. in 2007 coming from biomass (USDOE, 2013a)[38].

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

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[34] CEC, 2011b. List of Geothermal Powerplants in California. http://energyalmanac.ca.gov/renewables/

[35] CEC, 2013b. Electric Generation Capacity & Energy. http://energyalmanac.ca.gov/electricity/electric_generation_capacity.html

[36] California Geothermal Energy Statistics & Data. http://energyalmanac.ca.gov/renewables/geothermal/index.html

[37] Geothermal Energy. http://www.consumerenergycenter.org/renewables/geothermal/index.html

[38] Biomass Technology Basics. http://energy.gov/eere/energybasics/articles/biomass-technology-basics

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.

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.

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 (USDOE, 2013)[39].

The Los Angeles County Sanitation District (LACSD) operates a combined cycle turbine 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 anaerobic digestion use. 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

[39] Anaerobic Digestion Basics. http://energy.gov/eere/energybasics/articles/anaerobic-digestion-basics

helps the farm to be able to meet its own monthly electric and heat energy demand (CEC, 2014j)[40].

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, 2014j).

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 9.75 GWh[41] of electricity. Additionally, hundreds of homes and farms are using smaller wind turbines to produce electricity (CEC, 2014k)[42].

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

[40] Waste to Energy & Biomass in California. http://www.energy.ca.gov/biomass/index.html
[41] U.S. EIA, 2012b. Table 3.17 Net Generation from Wind. http://www.eia.gov/electricity/annual/html/epa_03_17.html
[42] Wind Energy in California. http://www.energy.ca.gov/wind/index.html

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. As of 2013, the capacity of PV systems reached about 3,072 MW[43], producing 5,389 GWh of electricity for the California (CEC, 2013d).

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

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[43] CEC, 2013b. Electric Generation Capacity & Energy. http://energyalmanac.ca.gov/electricity/electric_generation_capacity.html

produced 675 GWh in 2007, or 0.22 percent of the state's total electricity production (CEC, 2014d)[44].

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, 2014d).

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 2012, and 11 percent of total U.S. energy consumption (U.S. EIA, 2012)[45]. 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.

Gasoline is the most-used transportation fuel in California. Within the transportation sector, gasoline is used primarily by light-duty vehicles. In 2010, California consumed gasoline at a rate of 40.7 million gallons per day, or 10.7 percent of the national demand of 379.4 million gallons per day. SCAG is leading a regional effort with the goal of accelerating fleet conversion to near zero and zero-emission transportation technologies. Alternative fuels for transportation include, but are not limited to: biodiesel, electricity, ethanol, hydrogen, natural gas, propane, biobutanol, biogas, hydrogenation-derived renewable diesel (HDRD), methanol, P-Series, and xTL Fuels (Fischer-Tropsch). The Ports, vehicle manufacturers, and other entities are demonstrating new zero-emission truck technologies including battery-electric, fuel-cell, and hybrid-electric trucks with all electric range (AER) (SCAG, 2012a)[46].

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. In 2013, the total annual electricity consumption in the district was approximately 116,947 million kWh (36,109 million kWh for residential uses and 80,838 million kWh for non-residential uses)

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44 California Solar Energy Statistics & Data. http://energyalmanac.ca.gov/renewables/solar/index.html
45 California: State Profile & Estimates. http://www.eia.gov/state/?sid=CA
46 Regional Transportation Plan 2012-2035. http://rtpscs.scag.ca.gov/Documents/2012/final/f2012RTPSCS.pdf

(CEC, 2013). Table 3.3-7 shows the electricity use in Los Angeles, Orange, Riverside and San Bernardino counties in 2013.

TABLE 3.3-7

2013 Electricity Use in the District by County (in millions of kWh)

Sector	Los Angeles	Orange	Riverside	San Bernardino	Total
Residential	19,456	6,301	6,125	4,227	**36,109**
Non-Residential	48,654	13,721	8,566	9,897	**80,838**
Total	**68,110**	**20,022**	**14,691**	**14,124**	**116,947**

Source: CEC, Energy Consumption Data Management System, Energy Consumption by County, 2013. http://www.ecdms.energy.ca.gov/elecbycounty.aspx

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.

Based on CEC 2013 Revised High Energy Demand, California consumed approximately 12,767 million therms of natural gas per year in 2013. The SoCal Gas planning area is composed of the SCE, Burbank and Glendale, Pasadena, and LADWP electric planning areas. According to the SoCal Gas Baseline Natural Gas Forecast, approximately 7,357 million therms of natural gas were consumed. The CEC expects residential natural gas use to increase by approximately 1.5 percent per year and commercial natural gas use to increase by approximately3.9 percent per year (CEC, 2014a)[47]. Industrial natural gas demand has also increased such that 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.

[47] California Energy Demand: 2014-2024. http://www.energy.ca.gov/2013publications/CEC-200-2013-004/CEC_200-2013-004-SD-V1-REV.pdf

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, 2014)[48].

[48] California Energy Consumption Database. http://www.ecdms.energy.ca.gov/

SUBCHAPTER 3.4

HAZARDS AND HAZARDOUS MATERIALS

Hazardous Materials Regulations

Emergency Response to Hazardous Materials and Waste Incidents

Hazardous Materials Incidents

Hazards Associated with Air Pollution Control and Alternative Fuels

3.4 HAZARDS AND HAZARDOUS MATERIALS

Implementation of PR 4001, while 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 Recirculated NOP/IS identified he following adverse hazards and hazardous materials impacts specific to the implementation of the proposed project: use of alternative fuels in place of conventional fuels could result in increased hazards associated the increased transport; and, use and handling of alternative fuels. Potential exposure to a toxic air contaminant (ammonia) would be associated with installation and operation of control equipment that utilize selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) 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).

3.4.1 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.

3.4.1.1 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 document, the term hazardous material 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. Hazardous material is defined in HSC §25501 (k) 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 CCR Title 22 §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.

3.4.1.2 Federal Regulations

The USEPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment over air, water, and land. The USEPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The USEPA 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 USEPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

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 USEPA 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 U.S. 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 USEPA 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 USEPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

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 (§§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 (§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 (§§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 (§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.

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 USDOT (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to USDOT 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.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the USDOT. 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.

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 USEPA 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 USEPA, more strict hazardous waste standards, and a comprehensive 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 USEPA.

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 §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 §112 (r), USEPA 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.

<u>Hazardous Material Worker Safety Requirements</u>

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.

Procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste are promulgated in 29 CFR Part 1910, Subpart H. Some key subsections in 29 CFR Part 1910, Subpart H are §1910.106 -Flammable Liquids and §1910.120 - Hazardous Waste Operations and Emergency Response. In particular, 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 Part 1910 Subpart H, §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 Subpart H, §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 Part 1910, Subpart E, §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 which is promulgated in NFPA 704 - Standard System for the Identification of the Hazards of Materials for Emergency Response. 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 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

[1] NFPA, FAQ for Standard 704, 2007 edition. http://www.nfpa.org/Assets/files/AboutTheCodes/704/704-2007_FAQs.pdf

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	Not Applicable
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.	Not applicable

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 tha) 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 material.

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 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.

<u>Oil and Pipeline Regulations and Oversight</u>

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 USEPA has published regulations for aboveground storage facilities and the Coast Guard has done the same for oil tankers.

Oil Pollution Prevention Regulation: In 1973, the USEPA 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 40 CFR Part 112, Subparts A - C). 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 USDOT, 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.

3.4.1.3 State Regulations

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 HSC. 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 §§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 HSC §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 CCR, Title 27, 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: California HSC, 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 HSC 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 the California Department of Transportation (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.

3.4.1.4 Local Regulations

<u>SCAQMD</u>

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.

Regulations From 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 Federal Emergency Management Agency (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.

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 HSC, 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.

3.4.2 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.

3.4.3 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 USDOT Office of Hazardous Materials Safety (OHMS), 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 (USDOT, 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 U.S. By contrast, rail accounts of only six percent of total shipments of hazardous materials (USDOT, 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: USDOT, 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 (USDOT, 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 CalEMA 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 USDOT 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**

3.4.4 Hazards Associated With Air Pollution Control 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; and, 2) 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 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.

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.

<u>Ammonia</u>

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. While there are existing facilities that are currently permitted to use anhydrous ammonia, for new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia for the operation of air pollution control equipment. 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.

<u>LNG</u>

LNG is essentially no different from the natural gas used in homes and businesses every day, except that it has been refrigerated to -259 °F 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).

<u>LPG</u>

More than 350,000 light-and medium-duty vehicles travel the nation's highways using liquefied petroleum gas (LPG), while over four 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 five 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 (USDOE, 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[2]. 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 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, HSC §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:

2 The federal RMP program is administered in California through the California Accidental Release Prevention (CalARP) program (HSC §§ 25531 -25543.3 and CCR, Title 19 §§ 2735.1 to 2785.1).

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

3.5 HYDROLOGY AND WATER QUALITY

This subchapter describes existing regulatory setting relative to hydrology and water quality, including water supply, water demand, and drought trends within California and the SCAQMD.

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 USEPA is the federal agency responsible for water quality management and administration of the federal CWA. The USEPA 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).

<u>National Pollutant Discharge Elimination System Permit Program</u>

The CWA §402 established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into "navigable waters" of the United States. The USEPA 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 USEPA 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 USEPA 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 (USEPA, 2005)[1].

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 USEPA, 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.

CWA §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, USEPA 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.

[1] Stormwater Phase II Final Rule, Small Construction Program Overview. EPA 833-F-00-013. January, 2000 (revised December 2005), U.S. EPA, 2005.

The RWQCBs will be responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

State Water Quality Certification Program

The RWQCBs also coordinate the State Water Quality Certification program, or CWA §401. Under CWA §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 CWA §404 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 USEPA, 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 State of California was first granted primary enforcement responsibility for public water systems under section 1413 of the Safe Drinking Water Act on June 2, 1978 (43 FR 25180, June 9, 1978).

The California Safe Drinking Water Act, enacted in 1976, is codified in Title 22 of the CCR. The California Safe Drinking Water Act provides for the operation of public water systems and imposes various duties and responsibilities for the regulation and control of drinking water in the State of California including enforcing provisions of the federal Safe Drinking Water Act. The California Safe Drinking Water Program was originally implemented by the California Department of Public Health until July 1, 2014 when the program was transferred to the SWRCB via an act of legislation, SB 861. This transfer of authority means that the SWRCB has regulatory and enforcement authority over drinking water standards and water systems under Health and Safety Code §116271.

Potable water supply is managed through the following agencies and water districts: the California Department of Water Resources (DWR), the California Department of Health Services (DHS), the SWRCB, the USEPA, 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 USEPA 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)[2].

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).

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).

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.

[2] California Water Plan Update, 2009. Integrated Water Management. Bulletin 160-109, DWR, 2010.

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.

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)[3]. 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 SCAQMD.

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.

[3] Draft Program Environmental Impact Report for the 2012 – 2035 RTP/SCS. SCAG, 2012.

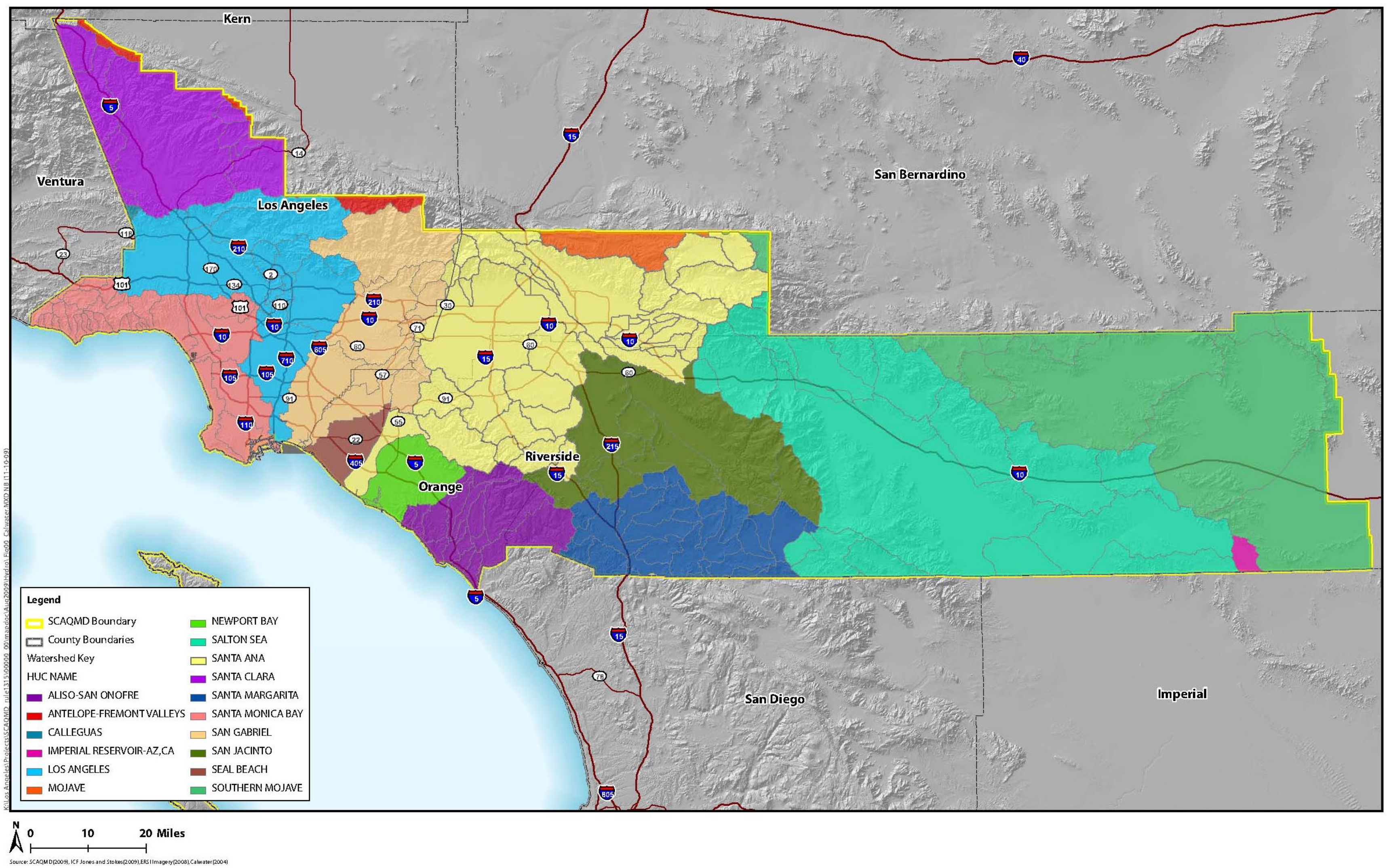

FIGURE 3.5-1
USGS Watersheds within the SCAQMD

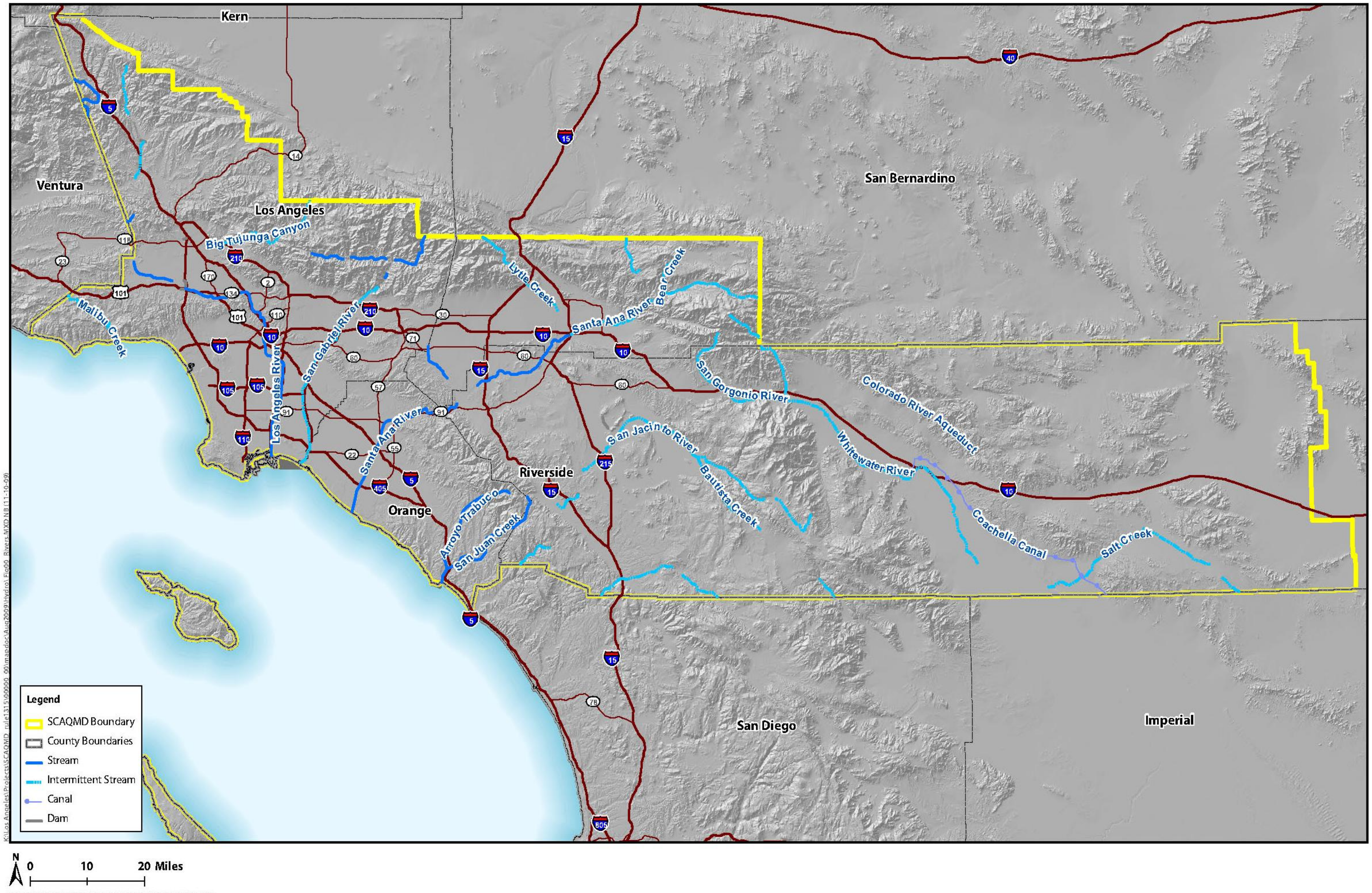

FIGURE 3.5-2
Rivers within the SCAQMD

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.

<u>Lakes and Reservoirs</u>

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[4] 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

[4] One acre-foot of water is equivalent to 325,851 gallons.

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 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	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
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

Source: Draft Program EIR for the 2012-2035 RTP/SCS; SCAG; December 2011, p. 3.13-13.
http://rtpscs.scag.ca.gov/Documents/peir/2012/draft/2012dPEIR_3_13_WaterResources.pdf

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 USEPA 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[5]. 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[6]. 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.

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 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, an uptick in water use 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

[5] Executive Order S-06-08; http://gov.ca.gov/news.php?id=9797
[6] State of Emergency – Water Shortage; http://gov.ca.gov/news.php?id=11557

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 was reported to be experiencing "poor" or "very poor" water conditions. 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.

This trend in water shortfall has continued throughout California. In May 2013, Governor Brown issued Executive Order B-21-13 to direct state water officials to expedite the review and processing of voluntary transfers of water and water rights[7]. In December 2013, the Governor formed a Drought Task Force to review expected water allocations, California's preparedness for water scarcity and whether conditions merit a drought declaration. In January 2014, the year 2013 was recorded as the driest year in California's history with California's river and reservoirs below their record lows as well as the snowpack's statewide water content at about 20 percent of normal average. Subsequently, on January 17, 2014, Governor Brown proclaimed a State of Emergency and directed state officials to take all necessary actions to prepare for drought conditions[8]. The proclamation directs state officials to assist farmers and communities that are economically impacted by dry conditions and to ensure the state can respond if there are drinking water shortages. The proclamation also directs state agencies to use less water and hire more firefighters and to initiate a greatly expanded water conservation public awareness campaign. Lastly, the proclamation gives state water officials more flexibility to manage supply throughout California under drought conditions. In response to Governor Brown's proclamation, the DWR took actions to conserve the state's water resources by supplying everyone (e.g., farmers, fish, and people throughout California's cities and towns) with less water[9]. It is important to note that almost all areas served by the SWP have other sources of water, such as groundwater, local reservoirs, and other supplies.

On March 1, 2014, Governor Brown signed a drought relief package [10] which provided $687.4 million to support drought relief, including money for housing and food for workers directly impacted by the drought, bond funds for projects to help local communities more efficiently capture and manage water and funding for securing emergency drinking water supplies for drought-impacted communities. In addition, the legislation increased funding for state and local conservation corps to assist communities with efficiency upgrades and reduce fire fuels in fire risk areas, and includes $1 million for the Save Our Water public awareness campaign to enhance its mission to inform Californians how they can do their part to conserve water. In addition, the legislation required the California Department of Public Health (DPH) to adopt new groundwater replenishment regulations by July 1, 2014, and for the State Water Resources

[7] Governor Brown Issues Executive Order to Streamline Approvals for Water Transfers to Protect California's Farms; http://gov.ca.gov/news.php?id=18048

[8] Governor Brown Declares Drought State of Emergency, January 17, 2014. http://gov.ca.gov/news.php?id=18368

[9] DWR Drops State Water Project Allocation to Zero, Seeks to Preserve Remaining Supplies. DWR, 2014. http://www.water.ca.gov/news/newsreleases/2014/013114pressrelease.pdf

[10] Governor Jerry Brown Signs Drought Relief Package, 2014. http://blogs.sacbee.com/capitolalertlatest/2014/03/jerry-brown-signs-drought-relief-package-in-dry-california.html

Control Board and the DPH to work on additional measures to allow for the use of recycled water and storm water capture for increasing water supply availability. The legislation also made statutory changes to: 1) ensure existing water rights laws are followed; 2) include streamlined authority to enforce water rights laws; and, 3) increase penalties for illegally diverting water during drought conditions. The legislation also provided the California Department of Housing and Community Development with the greatest flexibility to maximize migrant housing units[11].

As of May 29, 2014, the SWRCB issued a curtailment order for 2,648 water agencies and users (e.g., farms, cities and other property owners with so-called "junior" water rights, or those issued by the state after 1914, in the Sacramento River and its tributaries in the Sacramento Valley) to stop pumping water from the American, Feather and Yuba rivers as well as dozens of small streams[12]. Rain and snow from February and March storms have allowed the DWR to increase water contract allocations for SWP deliveries from zero to five percent. Precipitation from these recent storms also eliminated the need for rock barriers to be constructed in the Delta to prevent saltwater intrusion. Additional flexibility in salinity control requirements is being sought as an alternative to the Delta rock barriers that is less harmful for fish, wildlife, and other Delta water users. The Department of Fish and Wildlife (DFW) announced that it will fast-track actions to manage and reduce the drought's impact on fish[13].

On April 25, 2014, Governor Brown proclaimed a second State of Emergency, which waived compliance with CEQA and the state water code for a number of actions, including water transfers, wastewater treatment projects, habitat improvements for winter-run Chinook salmon imperiled by the drought and curtailment of water rights[14]. Furthermore, the order also suspended competitive bidding requirements for drought-related projects undertaken by a number of state agencies, including the DWR, DFW, and DPH. The proclamation closed a loophole that previously allowed homeowner associations to require residents to water lawns, even if the watering conflicted with local water agency rules, and to fine them if they did not comply. On September 16, 2014, Governor Brown signed legislation for California to begin regulating groundwater, a historic change that could lead to restrictions on pumping in some areas to prevent aquifers from dwindling and wells from running dry. The package of three laws put local agencies in charge of managing groundwater supplies, while giving the state new authority to step in when necessary to stabilize declining water tables. The new laws went into effect on January 1, 2015 and target areas where groundwater is being depleted faster than it is being replenished. Local agencies will then have until 2020 or 2022, depending on the severity of the situation, to develop plans for managing groundwater[15].

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11 Governor Brown, Legislative Leaders Announce Emergency Drought Legislation, 2014. http://gov.ca.gov/news.php?id=18415

12 California Orders Thousands of Sacramento Valley Water Users To Stop Pumping From Streams, 2014. http://www.sacbee.com/2014/05/29/6441935/state-orders-sacramento-valley.html

13 Late Storms Allow 5 Percent Allocation to State Water Project Users. DWR, 2014. http://www.water.ca.gov/news/newsreleases/2014/041814.pdf

14 Governor Brown Orders More Emergency Drought Measures, April 25, 2014. http://www.sacbee.com/2014/04/25/6354618/gov-brown-orders-more-emergency.html

15 Governor Jerry Brown Signs Landmark Groundwater Legislation, 2014. http://www.desertsun.com/story/news/environment/2014/09/16/california-groundwater-legislation/15725863/

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; 6) implementing a conservation campaign; 7) stopping water pumping from various streams; and, 8) adjusting water contract allocations. In addition, water shortages have prompted cities to begin infrastructure improvements to secure future water supplies.

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)[16].

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

[16]The Regional Urban Water Management Plan. MWD, 2010.

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) MWD, 2010 (c) LADWP, 2010 (d) AVEKWA, 2010
(e) Not Available (f) CLWA, 2011 (g) CVWD, 2011 (h) CLAWA, 2011
(i) DWA, 2011 (j) PWD, 2011 (k) SBVMWD, 2011 (l) SGPWA, 2010
(m) MWDOC, 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)[17]. 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

[17] The California Water Plan, DWR, 1998.

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).

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).

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).

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	2,300	SWP, groundwater, reclaimed water
Bard Irrigation District (and Yuma Project Reservation Division)	23	Colorado River
Castaic Lake Water Agency	125	SWP and groundwater
Coachella Valley Water District	974	SWP, Colorado River, and local
Crestline Lake Arrowhead	78	SWP
Desert Water Agency	324	SWP, Colorado River, 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	189	Colorado River
San Bernardino Municipal Water	328	SWP and groundwater
San Gorgonio Pass Water Agency	225	Groundwater

Source: Draft Program EIR for the 2012-2035 RTP/SCS; SCAG; December 2011, p. 3.13-20.
http://rtpscs.scag.ca.gov/Documents/peir/2012/draft/2012dPEIR_3_13_WaterResources.pdf

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, Littlerock Creek Irrigation District, Palmdale Water District, Crestline – Lake Arrowhead Water Agency, San Gorgonio Pass Water Agency, Desert Water Agency, Coachella Valley Water District, and San Gabriel Valley Municipal Water District (DWR, 2011).

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.

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 Valleys 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 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).

<u>Owens Valley Mono Basin (Los Angeles Aqueduct)</u>

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, 2011).

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 District'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 Municipal Water District (WMWD), 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)[18].

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

[18] Annual Progress Report to the California State Legislature, Metropolitan Water District; February, 2012.

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.

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 USEPA 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 total dissolved solids (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. The OCWD, 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 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 facility in San Pedro, 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 facilities handle more than 70 percent of the wastewater generated in the entire SCAG region (SCAG, 2008).

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 within the SCAQMD

WASTEWATER AGENCY	CURRENT FLOW (MGD)	CAPACITY FLOW (MGD)
Los Angeles County		
Los Angeles County Sanitation Districts		
Joint Water Pollution Control Plant	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
Total	**1,479.6**	**2,292**

Source: Draft Program EIR for the 2012-2035 RTP/SCS; SCAG; December 2011, p. 3.13-25.
http://rtpscs.scag.ca.gov/Documents/peir/2012/draft/2012dPEIR_3_13_WaterResources.pdf

SUBCHAPTER 3.6

SOLID AND HAZARDOUS WASTE

Regulatory Background

Solid Waste Management

Hazardous Waste Management

3.6 SOLID AND HAZARDOUS WASTE

This subchapter describes existing regulatory setting relative to solid and hazardous waste within the SCAQMD.

3.6.1 Regulatory Background

The Regulatory Background is divided into two sections: Solid Waste and Hazardous Waste.

3.6.1.1 Solid Waste

<u>Federal</u>

The USEPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment: air, water, and land. The USEPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The USEPA 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 TSCA. 40 CFR Part 258, Subpart D of 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 40 CFR Part 258, Subpart D, the USEPA delegated the enforcement responsibility to the State of California.

<u>State</u>

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. 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.

<u>Local</u>

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 an SRRE to CalRecycle that 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 (Public Resources Code §§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).

Los Angeles 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. SCAQMD Rule 1150.1 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).

3.6.1.2 Hazardous Waste

<u>Federal</u>

Hazardous material, as defined in 40 CFR Part 261.20 and 22 CCR Article 9, is required to be 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 USDOT, the FHWA, and the FRA. The HMTA requires that carriers report accidental releases of hazardous materials to the USDOT at the earliest practicable moment (49 CFR Part 171, Subpart C).

RCRA gives the USEPA 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 USEPA has delegated RCRA enforcement to the State of California.

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 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 a statewide hazardous waste management program, which is similar to but more stringent than the federal RCRA program. The HWCA is implemented by regulations in CCR Title 26 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 CCR 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.

<u>Local</u>

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 (CWM) Kettleman Hills facility in King's County, and the Clean Harbors facility in Buttonwillow (Kern County). Kettleman Hills has an estimated 15.65 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.

3.6.2 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 district as the emphasis on recycling to meet the requirements of AB 939 has served to divert tonnage from landfills and conserve landfill capacity. Table 3.6-1 shows data from CalRecycle regarding the number of tons disposed in 2014 (the most recent year for which information is available), for each county within the jurisdiction of the district.

TABLE 3.6-1
Solid Waste Disposed in 2014 by County

County	**Solid Waste Disposed** (tons)
Los Angeles	2,380,812
Orange	2,176,246
Riverside	1,747,442
San Bernardino	808,658
Total	**7,113,158**

Source: 2014 Landfill Summary Tonnage Report, CalRecycle, 2015
Http://www.calrecycle.ca.gov/SWFacilities/Landfills/Tonnages

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 31 Class III active landfills and two transformation facilities are located within the district with a total capacity of 107,933 tons per day and 3,240 tons per day[1], respectively (see Tables 3.6-2 and 3.6-3). The status of landfills within each county in the district is described in Tables 3.6-6 through 3.6-9.

TABLE 3.6-2
Number and Capacity of Class III Landfills by County

County	Number of Class III Landfills	Capacity (tons per day)
Los Angeles	11	41,749
Orange	3	23,500
Riverside[(a)]	7	24,314
San Bernardino[(a)]	10	18,369
Total	31	107,933

Source: 2012 Annual Report, Los Angeles County Countywide Integrated Waste Management Plan, Appendix E-2 Table 1 (LACDPW, 2013)
(a) Data presented is for the entire county and not limited to the portion of the county within the SCAQMD jurisdiction.

TABLE 3.6-3
Waste Transformation Facilities within the District and Permitted 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, 2013

3.6.2.1 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.

In 2012, residents and businesses in the county disposed of 8.7 million tons of solid waste at Class III landfills and transformation facilities located in and out of the county (see Tables 3.6-4 and 3.6-5). In addition, the amount of inert waste disposed at permitted inert waste landfills totaled 89,000 tons (LACDPW, 2013).

[1] This represents 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.

TABLE 3.6-4
Annual Disposal Rate for 2012 (County of Los Angeles)

Facility Type	**Disposal Rate** (million tons per year)
In-County Class III Landfills	6.239
Transformation Facilities	0.529
Exports to Out-of-County Landfills	1.844
Subtotal MSW[(a)] Disposed	**8.612**
Permitted Inert Waste Landfills	0.089
Grand Total Disposed	**8.701**

Source: LACDPW, 2013
(a) MSW = Municipal Solid Waste

TABLE 3.6-5
Average Daily Disposal Rate for 2012
(County of Los Angeles)

Facility Type	**Disposal Rate** (tons per day)
In-County Class III Landfills	19,997
Transformation Facilities	1,695
Exports to Out-of-County Landfills	5,911
Subtotal MSW[(a)] Disposed	**27,603**
Permitted Inert Waste Landfills	286
Grand Total Disposed	**27,889**

Source: LACDPW, 2013
(a) MSW = Municipal Solid Waste

Waste Generation

The 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 129 million tons (see Table 3.6-6).

TABLE 3.6-6
Los Angeles County Landfill Status as of 2012

Solid Waste Facilities	Total Annual Disposal in 2012 (million tons)	Average Daily Disposal in 2012 (tons per day)	Remaining Permitted Capacity (million tons)	Remaining Permitted Capacity (million cubic yards)	Estimated Year of Closure
Landfills:					
Antelope Valley	0.256	822	16.91	19.95	2042
Burbank	0.033	107	2.95	5.36	2053
Calabasas	0.197	633	5.51	12.34	2028
Chiquita Canyon	0.927	2,971	3.97	6.02	2014
Lancaster	0.213	682	12.27	14.49	2025
Pebbly Beach (Avalon)	0.003	9	0.09	0.10	2028
Puente Hills	2.168	6,950	6.10	11.09	2013
San Clemente	0.000	1	0.04	0.32	2032
Scholl Canyon	0.211	675	3.41	7.01	2028
Sunshine Canyon	2.217	7,107	74.37	96.39	2032
Whittier (Savage Canyon)	0.078	250	3.56	5.93	2025
Azusa[(a)]	0.089	286	64.13	52.13	
Total	**6.393**	**20,491**	**193.32**	**419.13**	**--**
Transformation Facilities:					
Commerce Refuse-to-Energy Facility	0.102	326	466.64	777.73	Not Applicable
Southeast Resource Recovery Facility	0.468	1,499	1,601.96	2,669.94	Not Applicable
Total	**0.570**	**1,825**	**2,068.60**	**3,447.67**	**--**

Source: LACDPW, 2013
(a) 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 41 years at another (LACDPW, 2013).

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.

3.6.2.2 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 3.6-7).

TABLE 3.6-7
Orange County Landfill Status

Landfill	**Total Annual Disposal in 2012** (tons)	**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 CIWMD. 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.

3.6.2.3 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. The six major sites have closure dates projected from 2021 to 2087. The projected date of closure for each landfill is tentative and could be affected by engineering, environmental, and waste flow issues (see Table 3.6-8).

TABLE 3.6-8
Riverside County Landfill Status

Landfill	**Total Annual Disposal in 2010** (tons)	**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	2087
El Sobrante	2,025,468	16,054	145,530,000	2045
Lamb Canyon	529,743	3,000	18,955,000	2021
Mecca II	0	0	0	Closed in 2007
Oasis	1,407	400	433,779	2055
Total	**3,089,583**	**23,914**	**183,831,438**	**--**

Source: CalRecycle, 2012

3.6.2.4 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 six active 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 3.6-9).

TABLE 3.6-9
San Bernardino County Landfill Status

Landfill	Total Annual Disposal in 2010 (tons)	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	2,000	13,605,488	2043
Victorville Sanitary	249,657	3,000	81,510,000	2047
Barstow Sanitary	64,612	1,500	77,304,902	2071
Landers Sanitary	46,407	1,200	765,098	2018
California Street	79,435	829	6,800,000	2042
Total	**1,099,487**	**16,029**	**247,505,488**	**--**

Source: CalRecycle, 2012

3.6.3 Hazardous Waste Management

Hazardous material, as defined in 40 CFR Part 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 CWM Kettleman Hills facility in King's County, and the Clean Harbors facility in Buttonwillow (Kern County).

The Kettleman Hills landfill is operating close to capacity. The DTSC has approved CWM's application to modify its RCRA permit at Kettleman Hills to allow for the expansion of its hazardous waste landfill, Unit B-18, by 14 acres and about 4.9 million cubic yards. CWM has also applied to the USEPA 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. Kettleman Hills landfill is permitted to dispose of or treat and store hazardous waste from all over California. The facility accepts almost all solid, semi-solid, and liquid hazardous waste. However, Kettleman Hills landfill is not permitted to accept biological agents or infectious wastes, regulated radioactive materials, or compressed gases and explosives.

Buttonwillow receives approximately 900 tons of hazardous waste per day. Buttonwillow has a maximum permitted throughput of 10,500 tons per day. The expectant life of the Buttonwillow Landfill is approximately 25 years.

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; CWM in

Carlyss, Louisiana, and Waste Control Specialists in Andrews, Texas. Incineration is provided at Laidlaw Environmental Services, Inc., located in Deer Park, Texas.

In 2013, less than 2.30 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 3.6-10). These amounts are increased from the totals of 2011 by approximately 99, 46, 81, and 2 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.

TABLE 3.6-10
Hazardous Waste Generation by County – 2013
(tons per year)

Waste Name	Los Angeles	Orange	Riverside	San Bernardino	Four County Total	Statewide Total
Waste & Mixed Oil	237,814	11,596	6,177	37,960	293,547	511,503
Inorganic Solid Waste	78,875	23,260	1,611	13,801	117,547	376,237
Contaminated Soils From Site Clean-up	1,401,202	10,941	5,260	8,370	1,425,773	2,016,359
Organic Solids	78,875	5,132	2,741	11,325	98,073	136,292
Asbestos Waste	35,314	9,964	4,631	5,880	55,789	97,503
Unspecified Oil-Containing Waste	29,135	4,172	1,646	34,418	69,371	115,504
Unspecified Solvent Mixture	19,468	1,287	340	601	21,696	50,226
Aqueous Solutions w/Organic Residues	20,773	2,710	846	5,055	29,384	61,862
Polychlorinated Biphenyls	18,032	7,521	82	835	26,470	38,243
Polymeric Resin Waste	124	15,773	8	31	15,936	16,032
Household Waste	3,086	2,172	376	501	6,135	13,292
Unspecified Aqueous Solution	15,664	1,716	746	2,437	20,563	34,783
Unspecified Organic Liquid Mixture	17,404	1,575	440	934	20,353	23,640
Aqueous Solution with Metals[a]	2,758	707	5	21	3,491	4,896
Unspecified Sludge Waste	1,253	244	1,234	327	3,058	17,200
Alkaline Solution (pH >= 12.5) W/O Metals	2309	323	688	98	3,418	8,733
Liquids w/Arsenic >= 500 mg/l[b]	239	--	46	0.01	285	223
Blank/Unknown	6,301	76,565	229	1,720	84,815	264,633
Totals	**1,968,626**	**164,728**	**27,106**	**124,134**	**2,295,704**	**3,787,161**

Source: DTSC, 2014
(--) Not on list of top twenty waste totals generated in the county.
(a) Smaller than restricted levels.
(b) 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 3.7

TRANSPORTATION AND TRAFFIC

Transportation Regulatory Framework

Existing Traffic Setting

3.7 TRANSPORTATION AND TRAFFIC

The proposed project may have direct or indirect traffic impacts associated with implementation of control strategies proposed by the Port(s). Traffic concerns are related to modifications to the existing transportation system that may generate significant impacts. This subchapter describes the current transportation system in southern California.

3.7.1 Transportation Regulatory Framework

3.7.1.1 Federal Regulatory Framework

Transportation Equity Act for the 21st Century

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.

3.7.1.2 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 Truck and Bus Regulation

CARB adopted the Truck and Bus Regulation in December 2008 to reduce PM and NOx emissions from existing diesel vehicles operating throughout California. This 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. This 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 3.7-1.

TABLE 3.7-1

CARB's Projected Populations of Near-Zero and Zero Emission Vehicles in the SCAQMD

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.

3.7.1.3 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 are required to 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.

3.7.1.4 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.

3.7.1.5 Transportation-related Policies in California

<u>METRANS Transportation Center</u>

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.

<u>Intelligent Transportation System</u>

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 depends 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.

3.7.2 Existing Traffic Setting

The southern California transportation system is a complex intermodal network designed to carry both people and goods that consists of roads, highways, public transit, paratransit, bus, rail, airports, seaports, and intermodal terminals. 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 decades 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.

3.7.2.1 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 3.7-2 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 3.7-2
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 Governments is a group of cities and communities geographically clustered and sometimes comprises 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.

3.7.2.2 Existing Circulation System

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 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 these areas are presented in Table 3.7-3 and Table 3.7-4, respectively.

TABLE 3.7-3
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 3.7-4
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 (e.g., from 6:00 a.m.to 9:00 a.m.) and evening peak periods (e.g., from 3:00 p.m. to 7:00 p.m.). 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 3.7-5 presents the existing travel delays and percent of regional VHT in delay by county on freeways and arterials. As shown in Table 3.7-5, 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. Also as shown in Table 3.7-5, 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.

TABLE 3.7-5
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.

As shown in Table 3.7-6. 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 (e.g., from a low of 13 miles in Orange County to a high of 18 miles in San Bernardino and Riverside counties). 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.

TABLE 3.7-6
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.

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 3.7-7.

TABLE 3.7-7
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 3.7-8. Vehicles with single passenger occupancy are 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 3.7-8
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.

Regional Freeway, Highway and Arterial System

The regional freeway and highway system as shown in Figure 3.7-1 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 3.7-9.

TABLE 3.7-9

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.

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 3.7-10.

TABLE 3.7-10

Existing Regional Freeway 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 facilities in the southern California area, including Metrolink station parking lots. These park and ride facilities are distributed amongst the four county areas as follows: 106 in Los Angeles County, 20 in Orange County, 25 in Riverside County, and 17 in San Bernardino County.

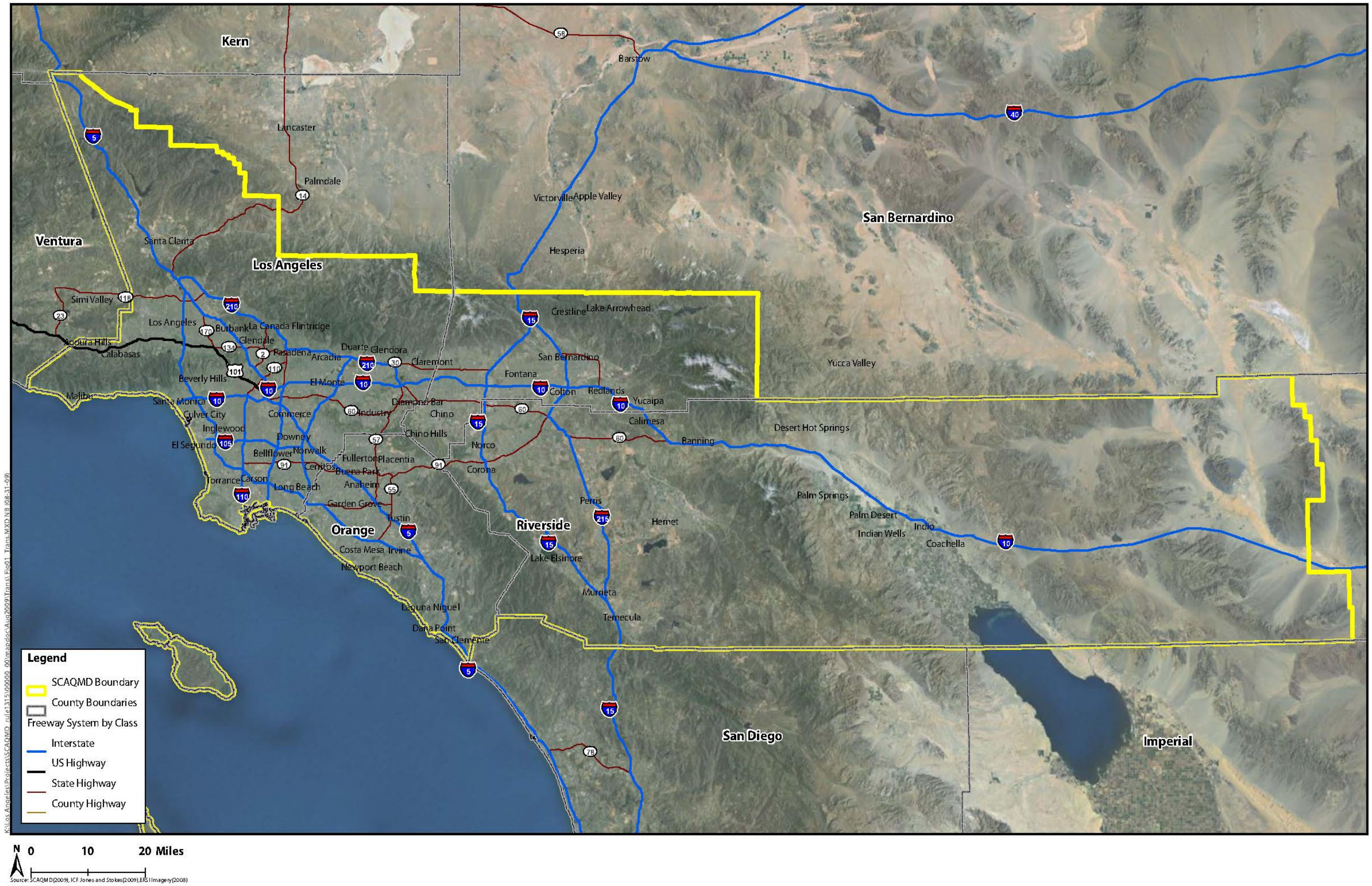

FIGURE 3.7-1
Major Freeway Routes within SCAQMD

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 3.7-11.

TABLE 3.7-11
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.

3.7.2.3 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.

Railroads

The southern California area is served by two main line commercial freight railroads (e.g., BNSF and UP). These railroads link southern California with other regions in California and the remainder of the United States, as well as 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 (SCIG) 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 (ICTF) 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).

<u>Marine Ports</u>

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).

3.7.2.4 Public Transit, Bicycle or Pedestrian Facilities

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).

Metro Rail System

Within the district, the Los Angeles County Metropolitan Transit Authority (Metro) provides urban rail transit service on six 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. The Purple Line connects Koreatown in the mid-Wilshire District to Union Station. The Metro Expo Line connects the 7th Street Metro Center in downtown Los Angeles to Culver City. 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. 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)

<u>Regional Commuter Rail</u>

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 the following county agencies tasked with reducing highway congestion and improving mobility throughout southern California: 1) Los Angeles County Metropolitan Transportation Authority (Metro); 2) Orange County Transportation Authority (OCTA); 3) Riverside County Transportation Commission; 4) San Bernardino Associated Governments (SanBAG); and, 5) 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.

<u>Bicycle and Pedestrian Facilities</u>

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

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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

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.

CHAPTER 4

ENVIRONMENTAL IMPACTS

4.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The CEQA Guidelines require environmental documents 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 problems caused by physical changes; and other aspects of the resource base, including water, scenic quality, and public services. 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].

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 environmental document 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 PEA analyzes impacts on a regional level and impacts on the level of individual industries or individual facilities only where feasible.

The categories of environmental impacts to be studied in a CEQA document are established by CEQA [Public Resources Code, §21000 et seq.], and the CEQA Guidelines, as promulgated by the State of California Secretary of Resources. Under the CEQA Guidelines, there are 17 environmental topic areas in which potential adverse impacts from a project are evaluated. Projects are evaluated against the environmental categories in an Environmental Checklist and those environmental categories that may be adversely affected by the proposed project are further analyzed in the appropriate CEQA document.

The proposed project is based on reducing NOx RTC holdings from certain NOx RECLAIM RTC holders. The likely possibility is that the affected source categories will reduce actual NOx emissions via physical modifications to a wide variety of equipment by installing new air pollution control equipment or modifying existing air pollution control equipment. Because of the number of potentially affected equipment units, these physical changes, while reducing NOx emissions, may cause potentially significant adverse secondary impacts. Pursuant to CEQA, an Initial Study, including an environmental checklist, was prepared for this project (see Appendix F). Of the 17 potential environmental impact categories, the following seven topic areas were identified in the NOP/IS as being potentially adversely affected by the proposed project: aesthetics; air quality and GHG emissions; energy; hazards and hazardous materials; hydrology and water quality; solid and hazardous waste; and, transportation and traffic. Eight comment letters were received relative to the NOP/IS. These comment letters and responses to the comments can be found in Appendix G of this document.

The seven environmental impact areas that were identified as potentially significant in the NOP/IS are further evaluated in detail in this PEA. The environmental impact analysis for each environmental topic incorporates a “worst-case” approach. This approach entails the premise that whenever the analysis requires that assumptions be made, assumptions that result in the greatest adverse impacts are typically chosen. This method ensures that all potential effects of the proposed project are documented for the decision-makers and the public. Accordingly, the following analyses use a conservative “worst-case” approach for analyzing the potentially significant adverse environmental impacts associated with the implementation of the proposed project.

The proposed project consists of applying a “shave” to holders of the top 90 percent of NOx RTCs (e.g., refineries, power plants, and other large RTC holders). The amount of the shave is weighted by a BARCT reduction contribution to achieve an overall reduction of 14 tons of NOx per day from current total RTC holdings (starting with the facility holding the most RTCs and proceeding to include 90 percent of the RTCs) by 2022 according to the following implementation schedule as summarized in Table 4.0-1:

Table 4.0-1
Implementation Schedule for NOx RTC Reductions

Implementation Year	Amount of NOx RTC Reductions (tons/day)
2016	4
2018	2
2019	2
2020	2
2021	2
2022	2
TOTAL	**14**

The NOx RTC shave will apply to 65 facilities. In addition, the RTC shave will apply to RTC investors, but they will be treated as 1 company. The RTC shave will apply to refineries, certain non-major facilities, and all power plants. The shave is distributed as follows:

- 67% shave for 9 refineries and investors (treated as one facility)
- 47% shave for 30 power plants
- 47% shave for 26 non-major facilities
- 0% shave for 210 remaining facilities

Note that for the remaining 210 facilities, no NOx RTC shave is proposed because no new BARCT was identified for the types of equipment and source categories at these facilities.

SCAQMD staff is proposing BARCT levels that will be applicable to the refinery sector (e.g., FCCUs, refinery process heaters and boilers, refinery gas turbines, petroleum coke calciner, and SRU/TGUs) and the non-refinery sector (e.g., container glass melting furnaces, sodium silicate furnaces, metal heat treating furnaces, non-refinery/non-power plant gas turbines, ICEs, and cement kilns). On an equipment/process basis, Table 4.0-2 summarizes the potential control technologies that will be considered as part of the BARCT analysis for the proposed project.

Table 4.0-2
BARCT Control Technology Options for Top NOx Emitting Equipment/Processes

Equipment/Process	BARCT Control Technology To Be Analyzed in PEA
FCCUs	1. SCR 2. LoTOx™ with WGS
Refinery Process Heaters and Boilers	SCR
Refinery Gas Turbines	SCR
SRU/TGUs	1. LoTOx™ with WGS 2. SCR
Petroleum Coke Calciner	1. UltraCat DGS 2. LoTOx™ with WGS
Portland Cement Kilns	None[1]
Container Glass Melting Furnaces	1. SCR 2. UltraCat DGS
Sodium Silicate Furnaces	1. SCR 2. UltraCat DGS (without sorbent)
Metal Heat Treating Furnaces	SCR
ICEs (Non-Refinery/Non-Power Plant)	SCR

Key: SCR = Selective Catalytic Reduction; WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber

Of the 65 facilities that would be subject to a shave of the NOx RTC holdings , the BARCT analysis found that it would be both feasible and cost-effective for operators of 20 facilities to install new control equipment or modify existing control equipment in response to the proposed NOx RTC shave for facilities which operate with current SCAQMD permits. Of the 20 facilities, 11 facilities belong to the non-refinery sector and 9 facilities belong to the refinery sector. Thus, the proposed project may result in the installation of new or the modification of existing NOx emission control equipment for 20 of these industrial equipment and processes (e.g., 9 facilities from the refinery sector and 11 facilities from the non-refinery sector). Accordingly, the analyses in the following subchapters for each environmental topic area focus on the potential environmental impacts that may occur as a result of installing new or modifying existing NOx emission control equipment at these 20 facilities.

[1] Because of CPCC's current permitting status for their Portland cement kilns (e.g., the permits were surrendered), CPCC operators will not be able to retrofit the Portland cement kilns with air pollution control equipment in response to the proposed project without first dealing with the permitting issues for the cement kilns. Thus, the installation of control technology and the secondary adverse environmental impacts that may be associated with such control technology is not a reasonably foreseeable consequence for CPCC under the present circumstances. Further, there are no other facilities in SCAQMD's jurisdiction that operate Portland cement kilns. Thus, this PEA does not contain an environmental analysis of the control technologies that were originally contemplated in the NOP/IS for the CPCC facility.

SUBCHAPTER 4.1

AESTHETICS

Introduction

Significance Criteria

Potential Aesthetics Impacts and Mitigation Measures

Cumulative Aesthetic Impacts

Cumulative Mitigation Measures

4.1 AESTHETICS

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in aesthetics impacts. The aesthetic impact analysis in this Draft PEA identifies the net effect on aesthetic resources from implementing the proposed project.

4.1.1 Introduction

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of new or the modification of existing NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx emissions at the affected facilities, once operational, which will provide air quality and human health benefits to the public. However, the NOP/IS identified potentially adverse aesthetics impacts from installing new or modifying existing air pollution control equipment and committed to analyzing in the PEA whether these activities would substantially degrade the existing visual character or quality of the site and its surroundings. The analysis of these impacts can be found in Section 4.1.3.

4.1.2 Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

4.1.3 Potential Aesthetics Impacts and Mitigation Measures

Table 4.1-1 summarizes the estimated number of NOx emission control devices per sector and per equipment/source category. The different types of control devices include Selective Catalytic Reduction (SCR), a proprietary Low Temperature Oxidation technology (LoTOx^{TM}) with or without a Wet Gas Scrubber (WGS), and catalyst impregnated filters with a Dry Gas Scrubber (UltraCat DGS). In total, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx^{TM} with WGSs, one LoTOx^{TM} without WGS, and three UltraCat DGSs.

Table 4.1-1
Estimated Number of NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Number of Affected Facilities	Estimated Number of Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	5	2 SCRs 2 LoTOx™ with WGSs 1 LoTOx™ without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	5	5 LoTOx™ with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx™ with WGS or 1 UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	1	2 SCRs or 1 UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	1	1 SCR or 1 UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	1	1 SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	3	16 SCRs
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	7	13 SCRs and 1 SCR replacement
		TOTAL	**114 to 117 SCRs** **7 to 8 LoTOx™ with WGSs** **1 LoTOx™ without WGS** **0 to 3 UltraCat DGSs**

4.1.3.1 Potential Aesthetics Impacts During Construction

Implementation of the proposed project could potentially result in construction activities at 20 NOx RECLAIM facilities, which are complex industrial facilities. The physical changes that are expected focus on the installation of new or the modification of existing control equipment for the following stationary sources of NOx: 1) FCCUs; 2) refinery boilers and heaters; 3) refinery gas turbines; 4) SRU/TGUs; 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant ICEs; 8) container glass melting furnaces; 9) coke calcining; and, 10) metal heat treating furnaces.

Due to the large size profiles of the affected equipment involved, the construction activities that may be associated with installing new or modifying existing NOx control equipment are expected to require the use of heavy-duty construction equipment, such as cranes, tractor/loader/backhoes, forklifts, et cetera. The use of cranes, in particular, because of their height when fully extended, may be visible to the surrounding areas and temporarily change the skyline of the affected facilities, depending on where they are located within each facility's property. Except for the use of cranes, the majority of the construction equipment is expected to be low in height and not substantially visible to the surrounding area due to existing fencing along the property lines and existing structures currently within the facilities that would buffer the views of the construction activities.

Because each affected facility is located in heavy industrial areas, the construction equipment is not expected to be substantially discernable from what exists on-site for routine operations and maintenance activities. Further, the construction activities are not expected to adversely impact views and aesthetics resources since most of the heavy equipment and activities are expected to occur within the confines of each existing facility and are expected to introduce only minor visual changes to areas outside each facility, if at all, depending on the location of the construction activities within the facility.

Lastly, the construction activities are expected to be temporary in nature and will cease following completion of the equipment installation or modifications. All construction equipment will be removed following completion of the proposed project. For these reasons, the construction activities are not expected to substantially degrade the existing visual character or quality of each affected site and the surroundings of each affected site. Thus, adverse visual continuity aesthetics impacts during construction are expected to be less than significant.

4.1.3.2 Aesthetics Mitigation During Construction

Less than significant adverse impacts associated with aesthetics are expected from the proposed project during construction, so no mitigation measures are required.

4.1.3.3 Remaining Aesthetics Impacts During Construction After Mitigation

The aesthetics analysis concluded that potential aesthetics impacts during construction would be less than significant, no mitigation measures were required. Thus, aesthetics impacts during construction remain less than significant.

4.1.3.4 Potential Aesthetics Impacts During Operation

Of the technologies proposed as BARCT for NOx control, only WGS technology was identified as having the potential to generate adverse aesthetic operational impacts. WGS technology is potentially BARCT for two FCCUs, five SRU/TGUs and one coke calciner.

SCRs, Ultracat DGSs, and LoTOx^{TM} technology without a WGS, if installed (or modified) and operated, would be expected to blend in with the existing industrial profile at the affected facilities because the heights of these units are typically smaller when compared to neighboring existing equipment onsite at a refinery and their associated stack heights would be about the same or shorter than existing stacks within the affected facilities. However, operation of one WGS is expected to generate a substantial, continuous steam plume that is white in appearance. A steam plume is generated as the result of using water to reduce particulate emissions in the WGS, and consists of water vapor and clean, but warm flue gas in the exit stream of the scrubber. As a result of atmospheric changes in temperature and humidity, the vapor plume is expected to be smaller on warm, dry days and larger on cool, damp days. Under certain atmospheric conditions, the steam plume from a WGS could extend as much as 1,500 feet in length from a relatively high flue gas stack at approximately 200 feet above grade. As the vapor travels away from the stack, the plume will eventually evaporate and become clear.

As a point of comparison, other equipment operating at these industrial facilities routinely generate steam plumes on a similar scale as part of their day-to-day operations (e.g., cooling towers, cogeneration plants, etc.). In addition, the refineries, which operate the FCCUs, SRU/TGUs, and coke calciner, are located near the Ports of Los Angeles and Long Beach whose facilities, such as the Harbor Cogeneration Plant and the Long Beach SERRF, routinely generate multiple steam plumes.

The Philips 66 Refinery in Wilmington recently installed a WGS to reduce NOx and PM10 emissions from their FCCU. The potential adverse aesthetics impacts were analyzed for this project in the Final Environmental Impact Report for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects[1]. The aesthetics analysis acknowledged that while the steam plume from the WGS would be visible, it was not expected to adversely affect the visual continuity of the surrounding area and none of the significance criteria were expected to be exceeded.

Further, in 2010, a similar aesthetics analysis relative to multiple WGSs and their associated steam plumes was also conducted in the Final Program Environmental Assessment prepared for the amendments to the SOx RECLAIM program[2]. This analysis in the SOx RECLAIM Final PEA also came to the same less than significant aesthetics impact conclusion as the Final EIR for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects, except that the SOx RECLAIM Final PEA assumed that up to as many as 11 WGSs could be installed.

For these reasons, if any WGS is installed as part of the proposed project at any of the affected facilities and even if all eight WGSs are installed, each steam plume, though visible, would not be expected to significantly adversely affect the visual continuity of the surrounding area of each affected facility because no scenic highways or corridors exist within the areas of the refineries. Further, the visual continuity of the surrounding area is not expected to be adversely impacted because each WGS, if constructed, will be built within the confines of industrial areas and would be visually consistent with the profiles of the existing affected facilities. Thus, even if each WGS could be visible, depending on the location within each property boundary, the aesthetic significance criteria would not be exceeded.

Overall, the aesthetics impacts are expected to be less than significant during operation for the proposed project.

1 SCAQMD, Final Environmental Impact Report for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects, SCH No. 2006111138, certified June 12, 2007. http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2007/feir-for-conocophillips-pm10-and-nox-reduction

2 SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM), SCH No. 2009061088, SCAQMD No. 06182009BAR, certified November 5, 2010. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2010/final-program-environmental-assessment-for-proposed-amended-regulation-xx.pdf?sfvrsn=4

4.1.3.5 Aesthetics Mitigation During Operation

Less than significant adverse impacts associated with aesthetics are expected from the proposed project during operation, so no mitigation measures are required.

4.1.3.6 Remaining Aesthetics Impacts During Operation After Mitigation

The aesthetics analysis concluded that potential aesthetics impacts during operation would be less than significant, no mitigation measures were required. Thus, aesthetics impacts during operation remain less than significant.

4.1.4 Cumulative Aesthetic Impacts

Because the project-specific aesthetic impacts do not exceed any applicable significance thresholds either during construction or operation, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative aesthetics impacts.

4.1.5 Cumulative Mitigation Measures

Because the project-specific aesthetic impacts during construction and operation are not considered to be cumulatively considerable, no cumulative mitigation measures are required.

SUBCHAPTER 4.2

AIR QUALITY AND GREENHOUSE GASES

4.2 AIR QUALITY AND GREENHOUSE GASES

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in air quality and greenhouse gas (GHG) impacts. The air quality and GHG analysis in this PEA identifies the net effect of air quality and GHG impacts from implementing the proposed project.

4.2.1 Introduction

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx at the affected facilities, which will provide air quality and human health benefits to the public. However, installing new or modifying existing air pollution control equipment is expected to have potentially adverse air quality and GHG impacts.

The environmental analysis assumes that installation of NOx control technologies for the affected sources will reduce NOx emissions overall, but construction activities associated with both the installation of new control devices and the modification of existing control devices will create secondary air quality impacts (e.g., emissions), which can adversely affect local and regional air quality. A project may generate emissions both during the period of its construction and through ongoing daily operations. During installation or modification of add-on air pollution control devices, emissions may be generated by onsite construction equipment and by offsite vehicles used for worker commuting. After construction activities are completed, emissions may be generated by the operation of the add-on air pollution control devices (as GHGs) and offsite vehicles used for delivering fresh materials needed for operations (e.g., chemicals, fresh catalyst, etc.) and hauling away solid waste for disposal or recycling (e.g., spent catalyst). The analysis of these impacts can be found in Section 4.2.3. Refer to Appendix E for the calculations used to estimate secondary construction- and operational-related air quality impacts.

4.2.2 Significance Criteria

To determine whether air quality and GHG impacts from adopting and implementing the proposed project are significant, impacts will be evaluated and compared to the following criteria. If impacts exceed any of the significance thresholds in Table 4.2-2, they will be considered significant. All feasible mitigation measures will be identified in Section 4.2.3 and implemented to reduce significant impacts to the maximum extent feasible. The SCAQMD makes significance determinations for construction impacts based on the maximum or peak daily emissions during the construction period, which provides a "worst-case" analysis of the construction emissions. Similarly, significance determinations for operational emissions are based on the maximum or peak daily allowable emissions during the operational phase.

The proposed project will have significant adverse air quality impacts if any one of the thresholds in Table 4.2-2 are equaled or exceeded.

4.2.3 Potential Air Quality Impacts and Mitigation Measures

Table 4.2-1 summarizes the estimated number of NOx emission control devices per sector and per equipment/source category. The different types of control devices include Selective Catalytic Reduction (SCR), a proprietary Low Temperature Oxidation technology (LoTOx^{TM}) with or without a Wet Gas Scrubber (WGS), and catalyst impregnated filters with a Dry Gas Scrubber (UltraCat DGS). In total, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx^{TM} with WGSs, one LoTOx^{TM} without WGS, and three UltraCat DGSs.

Table 4.2-1

Estimated Number of NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Number of Affected Facilities	Estimated Number of Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	5	2 SCRs 2 LoTOx^{TM} with WGSs 1 LoTOx^{TM} without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	5	5 LoTOx^{TM} with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx^{TM} with WGS or 1 UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	1	2 SCRs or 1 UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	1	1 SCR or 1 UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	1	1 SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	3	16 SCRs
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	7	13 SCRs and 1 SCR replacement
		TOTAL	**114 to 117 SCRs** **7 to 8 LoTOx^{TM} with WGSs** **1 LoTOx^{TM} without WGS** **3 UltraCat DGSs**

Table 4.2-2
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction [b]**	**Operation [c]**
NOx	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

Toxic Air Contaminants (TACs), Odor, and GHG Thresholds	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
GHG	10,000 MT/yr CO2eq for industrial facilities

Ambient Air Quality Standards for Criteria Pollutants [d]	
NO2 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)
PM10 24-hour average annual average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation) 1.0 μg/m^3
PM2.5 24-hour average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation)
SO2 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)
Sulfate 24-hour average	25 μg/m^3 (state)
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)
Lead 30-day Average Rolling 3-month average	1.5 μg/m^3 (state) 0.15 μg/m^3 (federal)

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[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: lbs/day = pounds per day; ppm = parts per million; μg/m^3 = microgram per cubic meter; ≥ = greater than or equal to; MT/yr CO2eq = metric tons per year of CO2 equivalents; > = greater than

4.2.3.1 Construction Analysis

Construction-related emissions can be distinguished as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NOx, SOx, CO, VOC, PM2.5 and PM10) from heavy-duty construction equipment operation, fugitive dust (primarily as PM10) from disturbed soil, and VOC emissions from asphaltic paving and painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (primarily as PM10) from worker commute trips, material delivery trips, and haul truck material trips to and from the construction site. In general, limited construction emissions from site preparation activities, which may include earthmoving/grading, are anticipated because the sites, typically, have already been graded and paved. Further, operators at each affected facility who construct NOx control equipment that utilize chemicals as part of the NOx control equipment operations, such as a new ammonia or caustic storage tank, may also need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release, pursuant to U.S. EPA's spill prevention control and countermeasure regulations.

The space limitations within each affected facility have been evaluated and each facility was determined to have sufficient space to install new NOx control equipment or modify existing NOx control equipment. However, because installation of larger NOx air pollution control equipment such as a new scrubber (WGS or DGS), may need to occupy the space of previous equipment, demolition activities were assumed to occur prior to the equipment installation to remove any existing equipment or structures (as applicable), remove the old piping and electrical connections, and break up the old foundation with a demolition hammer. For these reasons, digging, earthmoving, grading, slab pouring, or paving activities are anticipated and were analyzed.

The type of construction-related activities attributable to installing new NOx control equipment or modifying existing NOx control equipment would consist predominantly of deliveries of steel, piping, wiring, chemicals, catalysts, and other materials, and would also involve maneuvering the materials within the site via a variety of off-road and on-road equipment such as a crane, forklift et cetera or haul truck, respectively. If a new foundation is not needed, to establish footings or structure supports, some concrete cutting and digging may be necessary in order to re-pour new footings prior to building above the existing foundation.

Non-Refinery Facilities

Of the 275 facilities subject to the NOx RECLAIM Rules, there are currently 206 facilities that belong to the non-refinery sector. SCAQMD staff conducted an analysis of the potential feasibility and cost-effectiveness of adding controls to reduce NOx from all of these facilities. This analysis found that it would be both feasible and cost-effective for only 11 non-refinery facilities to install air pollution controls. However, for all other non-refinery facilities, because of the lack of feasible of cost-effective controls, operators of the remaining non-refinery facilities will comply with their NOx shave through the purchase of RTCs which will have no environmental impact.

In 2011, the 11 non-refinery facilities emitted approximately 2.82 tons per day or 14 percent of the total NOx emitted from facilities in the RECLAIM program. These facilities include the following equipment/source categories: container glass melting furnaces, glass melting furnace facilities, sodium silicate furnaces, metal heat treating furnaces, stationary ICEs and non-power plant stationary gas turbines. As stated previously, under the proposed project, operators of these facilities could potentially install SCR technology or UltraCat filtration units to reduce NOx emissions. For the purpose of conducting a worst-case analysis, 34 SCR units and one UltraCat filtration unit are assumed to be installed at the 11 non-refinery affected facilities. It is possible that another UltraCat filtration unit may also be installed instead of one of the 34 SCR units.

Ammonia or urea is necessary to operate SCR and UltraCat filtration technology, and tanks to store these chemicals would also need to be installed. The size of each ammonia tank needed to operate the SCR units and one UltraCat filtration unit have been estimated to range between 600 and 10,000 gallons in capacity. If a second UltraCat filtration unit is installed in lieu of one of the 34 SCR units, two 300 gallon ammonia portable totes instead of one ammonia storage tank would be needed[3]. Also, since an adsorbent would be needed to operate the second UltraCat unit, a 5,000-cubic foot hydrated lime silo would be needed. Because the non-refinery affected facilities are existing facilities, it was assumed that no more than one acre of area would need to be disturbed at a single facility at a given time. Construction was assumed to consist of four phases: 1) demolition; 2) site preparation; 3) paving; and, 4) building of the emission control units along with supporting devices and structures. A list of the construction equipment expected to be needed for each construction phase at a single non-refinery affected facility is presented in Table 4.2-3 below.

It is important to note that six of the non-refinery affected facilities have space restrictions that could limit mobility throughout the facility, and these same six facilities could potentially install more than one SCR unit. As such, the analysis assumes that the same amount of construction equipment would be used at these facilities, but that the construction duration would be extended over a longer period of time.

Construction emissions associated with installing air pollution control equipment at each of the 11 non-refinery facilities were estimated using the California Emission Estimator Model (CalEEMod). To allow for enough lead time needed to procure contracts and order equipment, construction is expected to begin in 2016 and, depending on the facility, construction could last over a year. Table 4.2-4 presents the peak daily emissions from construction activities to install control equipment at one facility. To conduct a conservative analysis, overlapping construction activities were assumed to occur at all 11 of the non-refinery facilities. Table 4.2-5 presents the peak daily emissions if construction occurs simultaneously at all 11 non-refinery facilities.

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3 For a worst-case analysis, the impacts from a second UltraCat unit have been included in the calculations.

Table 4.2-3
Construction Equipment That May Be Needed To Install
One Air Pollution Control Device at One Non-Refinery Facility

Construction Phase	Off-Road Equipment Type	Amount	Daily Usage Hours
Building Construction	Cranes	1	6
Building Construction	Forklifts	1	6
Building Construction	Generator Sets	1	8
Building Construction	Tractors/Loaders/Backhoes	1	6
Building Construction	Welders	2	8
Building Construction	Aerial Lifts	1	8
Demolition	Concrete/Industrial Saws	1	8
Demolition	Rubber Tired Dozers	1	8
Demolition	Tractors/Loaders/Backhoes	1	8
Demolition	Cranes	1	8
Paving	Cement and Mortar Mixers	1	6
Paving	Paving Equipment	1	8
Paving	Plate Compactors	1	6
Paving	Tractors/Loaders/Backhoes	1	8
Site Preparation	Rubber Tired Dozers	1	7
Site Preparation	Tractors/Loaders/Backhoes	1	8
Site Preparation	Trenchers	1	8

Table 4.2-4
Peak Daily Construction Emissions per Control Equipment
at One Non-Refinery Facility

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Unmitigated	3.7	31.7	21.7	0.03	7.1	4.1
Mitigated*	3.7	31.7	21.7	0.03	3.5	2.3
Significance Threshold	**75**	**550**	**100**	**150**	**150**	**55**
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

Table 4.2-5
Peak Daily Construction Emissions at 11 Non-Refinery Facilities

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Unmitigated	40	349	239	0.4	78	45
Mitigated*	40	349	239	0.4	39	25
Significance Threshold	**75**	**550**	**100**	**150**	**150**	**55**
Exceed Significance?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

Refinery Facilities

There are nine refinery facilities subject to the NOx RECLAIM rules whose operators may choose to install NOx air pollution control equipment in response to the proposed project. These facilities include the following equipment/source categories: FCCUs, SRU/TGUs, coke calciner, refinery boilers and heaters, and refinery gas turbines. As summarized in Table 4.2-6, several types of NOx control technology may be installed on the various equipment/source categories operating at the nine affected refinery sector facilities.

Table 4.2-6

Estimated Number of NOx Control Devices to be Installed at 9 Refinery Facilities

Sector	Equipment/Source Category	Number of Affected Facilities*	Estimated Number of NOx Control Devices
Refinery	FCCUs	5	2 SCRs 2 LoTOx^{TM} with WGSs 1 LoTOx^{TM} without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	SRU/TGUs	5	5 LoTOx^{TM} with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx^{TM} with WGS or 1 UltraCat with DGS
		TOTAL	**84 SCRs** **8 LoTOx^{TM} with WGSs** **1 LoTOx^{TM} without WGS** **1 UltraCat DGS**

* While the total number of affected facilities for the refinery sector is nine, there is an overlap for all of the equipment/source categories except the petroleum coke calciner.

The overall objective of the proposed project is to reduce NOx emissions. However, in consideration of the complexity involved with operating FCCUs, SRU/TGUs, refinery boilers/heaters, coke calciners, and gas turbines, the equipment operators utilize a combination of various emission control equipment and techniques to control not only NOx, but other pollutants such as SOx, CO, PM10, PM2.5, and ammonia slip, as applicable, while maintaining overall efficiency. As there is no way to fully predict on a case-by-case basis what each facility operator will do to comply with the proposed project, the estimates in this CEQA analysis are based on the estimates provided in the Preliminary Draft Staff Report (which are based on information reported by the refineries in the survey and information from the control device manufacturers as well as the consultant reports prepared for each affected facility) combined with the assumptions applied in the previous CEQA documents which analyzed similar equipment in both the 2005 amendments to NOx RECLAIM and the 2010 amendments to SOx RECLAIM. Further, if a particular technology was identified as having a cost that exceeds $50,000 per ton, this CEQA analysis assumed that the facility operator would not install this type of air pollution control technology in response to the project.

For the purpose of conducting a worst-case analysis, 84 SCR units, eight LoTOx™ with WGSs, one LoTOx™ without a WGS, and one UltraCat DGS are assumed to be installed at the nine refinery sector facilities. In order to operate SCR and UltraCat technology, ammonia is necessary and, as such, tanks to store ammonia would also need to be installed. The size of each ammonia tank needed to operate the SCR units and one UltraCat filtration unit have been estimated to range between 2,000 and 11,000 gallons in capacity. The UltraCat filtration unit that was analyzed for the coke calciner would also need to utilize hydrated lime (Ca(OH)2) as an adsorbent. Further, three LoTOx™ with WGSs for two FCCUs and one coke calciner may need to utilize sodium hydroxide (NaOH) to capture emissions. As such, tanks to store the hydrated lime and sodium hydroxide would also need to be installed.

Because the amount of plot space that may be needed to install one or more NOx control devices at any of the affected facilities would not exceed one acre, no more than one acre of area would need to be disturbed at a single facility at a given time. Construction was assumed to consist of two phases: 1) demolition; and 2) construction to install the air pollution control devices units along with supporting devices and structures. In addition, for facilities that will need to install tanks to store ammonia or sodium hydroxide, a site preparation phase was also included to account for building a containment berm as part of installing a storage tank.

A list of the anticipated construction equipment needed to install one SCR for either a refinery boiler/heater or refinery gas turbine at one refinery facility is presented in Table 4.2-7. A list of the anticipated construction equipment needed to install one SCR for one FCCU is presented in Table 4.2-8. Finally, a list of the anticipated construction equipment needed to install one scrubber, either WGS or DGS, for one refinery facility is presented in Table 4.2-9.

There are multiple source categories with multiple approaches to reducing NOx at the refinery facilities. With so many possibilities or permutations of how operators of the refinery could achieve actual NOx reductions, there is no way to predict what each facility operator will actually do. For this reason, the analysis illustrates the worst-case effects of applying the various NOx control technologies to each affected refinery facility. As a result, the construction emissions were calculated for each of the nine refineries.

From a construction point of view, the installation of a NOx control technology at a refinery is a complex process. For example, if a facility operator chooses to install NOx control equipment, time will be needed for pre-construction/advance planning activities such as engineering analysis of the affected equipment, engineering design of the potential control equipment, contracting with a vendor, securing financing, ordering and purchasing the equipment, obtaining permits and clearances, and scheduling contractors and workers. The amount of lead time can vary from six months (e.g., for a SCR for refinery/boiler heater or gas turbine) to up to 18 months for a scrubber (either a WGS or DGS).

Then to physically build the equipment, an additional six to 18 months would be needed. For example, six months would be needed to construct one SCR for one refinery boiler/ heater or gas turbine, 12 months would be needed to construct a SCR for a FCCU, and up to

18 months would be needed to construct a scrubber (either a WGS or DGS) for a FCCU or SRU/TGU. Where the new equipment will be sited will determine if any demolition activities would be required. For this analysis for a scrubber installation, to be conservative, one month of demolition activities is assumed to occur at each affected facility and an additional 17 months is assumed for site preparation, assembly and installation of the unit and ancillary support equipment, preparation of the affected unit for a turnaround/shutdown, and tying-in the new scrubber to the affected equipment.

Table 4.2-7

Construction Equipment Needed To Install 1 SCR for 1 Refinery Boiler/Heater/Gas Turbine

Off-Road Equipment Type	Amount	Daily Usage Hours
Rough Terrain Crane (28 ton)	1	8
Welders	2	8
Air Compressor	1	1
Backhoe	1	4
Plate Compactor	1	4
Forklift	1	3
Concrete Pump	1	2
Concrete Saw	1	2
Generator	1	8
Aerial Lift (Man lift)	1	2

Table 4.2-8

Construction Equipment Needed To Install 1 SCR For 1 FCCU

Off-Road Equipment Type	Amount	Daily Usage Hours
Crane	1	8
Rough Terrain Crane (28 ton)	1	8
Welders	5	8
Air Compressor	1	8
Backhoe	1	8
Plate Compactor	1	2
Forklift	1	6
Concrete Pump	1	2
Concrete Saw	1	2
Generator	2	8
Aerial Lift (Man lift)	2	2

Table 4.2-9
Construction Equipment Needed To Install 1 WGS or DGS At 1 Refinery Facility

Construction Phase	Off-Road Equipment Type	Amount	Daily Usage Hours
Demolition	Crane	1	8
Demolition	Front End Loader	1	8
Demolition	Forklift	1	8
Demolition	Concrete Saw	1	8
Demolition	Jack Hammer	1	8
Construction	Backhoe	1	8
Construction	Crane	2	8
Construction	Aerial Lift	3	8
Construction	Forklift	1	8
Construction	Generator	1	8
Construction	Welders	10	8
Construction	Cement Mixer	1	2

For any facility operator that plans to undergo construction to install NOx control equipment, and prior to receiving any permit to construct from the SCAQMD, a site-specific CEQA analysis in addition to this PEA may also be necessary depending on how much construction (i.e., demolition, site grading, etc.) would be involved and if the analysis varies from the assumptions in this document. For these reasons, the timing of constructing all of the possible NOx controls equipment is conservatively estimated to overlap for each refinery facility, at the earliest in 2016 because of the lead time that will be needed for most of types of NOx control projects contemplated in this PEA. This means that any on-road or off-road emission factors applied to calculate construction and operational impacts will conservatively be for equipment fleet year 2016 even though it is likely that all of the refinery facilities would begin construction activities well after 2016. While the NOx shave begins in 2016 with a four ton per year reduction in RECLAIM Trading Credits (RTCs), the available NOx RTCs continue to be reduced in two ton increments until 2022. In addition, the decision when construction would commence between 2016 and 2022 for refinery facilities in particular is also dependent upon the turnaround schedule of the affected equipment. Once construction of the control equipment is completed, it will need to be "tied-in" to the main equipment prior to start-up which typically occurs during a scheduled turnaround period.

To conduct a conservative "worst-case" analysis, this document examines the possibility that the facility operators will install NOx control equipment, including but not limited to exhaust stacks, cooling units, injection support equipment for catalyst, caustic, or sorbents including the associated storage vessels, associated piping designs, pumps, plus other ancillary equipment, as applicable. As a practical matter, construction activities that are anticipated to occur as a result of implementing the proposed project would likely occur prior to a scheduled maintenance (e.g., turnaround) of the affected unit.

Typically construction projects have staggered construction schedules which take into account design and engineering, ordering, purchasing and delivery of equipment, permitting and environmental review, the availability of construction crews, budgeting, and any other construction projects on site. However, due to wide range of construction time necessary to build the various types of NOx control equipment, the construction activities at other affected facilities could overlap. However, because of widely varying turnaround schedules of affected equipment within any given facility and based on past construction projects involving major construction equipment where the SCAQMD was the lead agency, the analysis in this PEA includes a conservative assumption that all of the refineries will have overlapping construction activities occurring in one year. However, since having all facilities construct all NOx controls within the first year is unlikely, for demonstrative purposes, the analysis also includes an analysis of the overlapping impacts spread out over a five- and seven-year period.

Table 4.2-10 presents the peak daily emissions from construction activities to install control equipment at each of the nine refinery facilities. To conduct a conservative analysis, overlapping construction activities were assumed to occur at all nine of the refinery facilities. Table 4.2-11 presents the peak daily emissions if construction spanning a five year period between 2016 and 2020 occurs at all nine refinery facilities. Finally, Table 4.2-12 presents the peak daily emissions if construction spanning a seven year period between 2016 and 2022 occurs at all nine refinery facilities.

Table 4.2-10

Peak Daily Construction Emissions to Install Various NOx Control Equipment at 9 Refinery Facilities in the Same Year

Refinery Facility Number	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 Unmitigated (lb/day)	PM10 Mitigated* (lb/day)	PM2.5 Unmitigated (lb/day)	PM2.5 Mitigated* (lb/day)
1	56	338	209	0.41	274	156	137	78
2	36	233	104	0.20	30	30	12	12
3	8	42	42	0.08	98	50	50	26
4	44	275	146	0.28	128	81	62	38
5	72	449	270	0.65	326	184	164	93
6	66	404	250	0.55	324	183	163	92
7	16	83	84	0.17	148	77	76	41
8	48	296	167	0.33	177	106	87	52
9	44	275	146	0.28	175	104	86	50
Grand Total Over Same Year	**389**	**2,396**	**1,417**	**2.97**	**1,680**	**970**	**838**	**483**
Significance Threshold	75	550	100	150	150	150	55	55
Exceed Significance?	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**

*Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.

Table 4.2-11
Peak Daily Construction Emissions to Install Various NOx Control Equipment at 9 Refinery Facilities Between 2016 and 2020

Refinery Facility Number	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 Unmitigated (lb/day)	PM10 Mitigated* (lb/day)	PM2.5 Unmitigated (lb/day)	PM2.5 Mitigated* (lb/day)
1	56	338	209	0.41	274	156	137	78
2	36	233	104	0.20	30	30	12	12
3	8	42	42	0.08	98	50	50	26
4	44	275	146	0.28	128	81	62	38
5	72	449	270	0.65	326	184	164	93
6	66	404	250	0.55	324	183	163	92
7	16	83	84	0.17	148	77	76	41
8	48	296	167	0.33	177	106	87	52
9	44	275	146	0.28	175	104	86	50
Peak Daily Emissions with One Year of Construction	**389**	**2,396**	**1,417**	**2.97**	**1,680**	**970**	**838**	**483**
Peak Daily Emissions with Five Years of Construction	**78**	**479**	**283**	**0.59**	**336**	**194**	**168**	**97**
Significance Threshold	75	550	100	150	150	150	55	55
Exceed Significance?	**YES**	**NO**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

Table 4.2-12
Peak Daily Construction Emissions to Install Various NOx Control Equipment at 9 Refinery Facilities Between 2016 and 2022

Refinery Facility Number	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 Unmitigated (lb/day)	PM10 Mitigated* (lb/day)	PM2.5 Unmitigated (lb/day)	PM2.5 Mitigated* (lb/day)
1	56	338	209	0.41	274	156	137	78
2	36	233	104	0.20	30	30	12	12
3	8	42	42	0.08	98	50	50	26
4	44	275	146	0.28	128	81	62	38
5	72	449	270	0.65	326	184	164	93
6	66	404	250	0.55	324	183	163	92
7	16	83	84	0.17	148	77	76	41
8	48	296	167	0.33	177	106	87	52
9	44	275	146	0.28	175	104	86	50
Peak Daily Emissions with One Year of Construction	**389**	**2,396**	**1,417**	**2.97**	**1,680**	**970**	**838**	**483**
Peak Daily Emissions with Seven Years of Construction	**56**	**342**	**202**	**0.42**	**240**	**139**	**120**	**69**
Significance Threshold	75	550	100	150	150	150	55	55
Exceed Significance?	**NO**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**YES**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

Combined Construction Emissions From Non-Refinery and Refinery Facilities

As explained previously, due to the inability to predict if and when each operator of a non-refinery and a refinery facility alike would choose to install control equipment as a consequence to implementing the proposed project, the analysis conservatively assumes that construction activities within each of the non-refinery facilities and refinery facilities could overlap beginning in 2016.

Table 4.2-13 presents the peak daily emissions from construction activities to install control equipment at all 20 facilities (e.g., 11 non-refinery facilities plus 9 refinery facilities) and conservatively assumes that the overlapping construction activities will occur in the same year. However, since the operators of refinery facilities will need sufficient time to conduct advanced planning and financing for their capital improvement projects, it is likely that only minimal, if any, construction activities would occur at any refinery facilities during 2016. To account for the construction fluctuations that may occur, Tables 4.2-14 and 4.2-15 presents the peak daily emissions if construction occurs at all 20 facilities and spans a five year period between 2016 and 2020 and a seven year period between 2016 and 2022, respectively.

Table 4.2-13
Peak Daily Overlapping Non-Refinery and Refinery Construction Emissions
to Install Various NOx Control Equipment in Same Year

Sector Type	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 Unmitigated (lb/day)	PM10 Mitigated* (lb/day)	PM2.5 Unmitigated (lb/day)	PM2.5 Mitigated* (lb/day)
9 Refineries	389	2,396	1,417	2.97	1,680	970	838	483
11 Non-Refineries	40	349	239	0.4	78	39	45	25
Peak Daily Emissions with One Year of Construction	**429**	**2,745**	**1,656**	**3.37**	**1,758**	**1,009**	**883**	**508**
Significance Threshold	75	550	100	150	150	150	55	55
Exceed Significance?	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

Table 4.2-14
Peak Daily Overlapping Non-Refinery and Refinery Construction Emissions
to Install Various NOx Control Equipment Between 2016 and 2020

Sector Type	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 Unmitigated (lb/day)	PM10 Mitigated* (lb/day)	PM2.5 Unmitigated (lb/day)	PM2.5 Mitigated* (lb/day)
9 Refineries	78	479	283	0.59	336	194	168	97
11 Non-Refineries	8	70	48	0.08	16	8	9	5
Peak Daily Emissions with Five Years of Construction	**86**	**549**	**331**	**0.67**	**352**	**202**	**117**	**102**
Significance Threshold	75	550	100	150	150	150	55	55
Exceed Significance?	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

Table 4.2-15

Peak Daily Overlapping Non-Refinery and Refinery Construction Emissions to Install Various NOx Control Equipment Between 2016 and 2022

Sector Type	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 Unmitigated (lb/day)	PM10 Mitigated* (lb/day)	PM2.5 Unmitigated (lb/day)	PM2.5 Mitigated* (lb/day)
9 Refineries	56	342	202	0.42	240	139	120	69
11 Non-Refineries	6	50	34	0.06	11	6	6	4
Peak Daily Emissions with Seven Years of Construction	**62**	**392**	**236**	**0.48**	**251**	**145**	**126**	**73**
Significance Threshold	75	550	100	150	150	150	55	55
Exceed Significance?	**NO**	**NO**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**

**Mitigation includes standard fugitive dust controls applied pursuant to Rule 403.*

For the simultaneous construction of NOx control equipment at non-refinery and refinery facilities for construction all in the same year or for construction spread out over five years, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance thresholds for NOx, VOCs, CO, PM10, and PM2.5. For the simultaneous construction of NOx control equipment at non-refinery and refinery facilities for construction spread out over seven years, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance thresholds for NOx, PM10, and PM2.5. Appendix E contains the spreadsheets with the results, assumptions, and methodologies used by the SCAQMD staff for this analysis.

With regard to odors, currently, for all diesel-fueled construction equipment and vehicles, the diesel fuel is required to have a low sulfur content (e.g., 15 ppm by weight or less) in accordance with SCAQMD Rule 431.2 – Sulfur Content of Liquid Fuels. Because the operation of the construction equipment for both non-refinery and refinery facilities will occur within the confines of existing affected facilities, sufficient dispersion of diesel emissions over distance generally occurs such that odors associated with diesel emissions may not be discernable to offsite receptors, depending on the location of the equipment and its distance relative to the nearest offsite receptor. Further, construction worker vehicles and delivery trucks onsite as a part of construction activities will not be allowed to idle longer than five minutes per any one location in accordance with the CARB idling regulation, so odors from these vehicles would not be expected. Thus, the proposed project is not expected to create significant adverse objectionable odors during construction. Since no significant impacts were identified for this issue, no mitigation measures for odors are necessary or required.

4.2.3.2 Construction Mitigation

The VOC, NOx, CO, PM10, and PM2.5 emissions for construction occurring in the same year and for construction spread out over five years exceed the applicable significance thresholds during construction. The NOx, PM10, and PM2.5 emissions for construction spread out over seven years also exceed the applicable significance thresholds during construction. As a result, the proposed project is expected to have significant adverse construction air quality impacts. If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the significant adverse impacts (CEQA Guidelines §15126.4). Mitigation measures focus on the construction emissions of VOC, NOx, CO, PM10 and PM2.5 emissions. Therefore, feasible mitigation measures to reduce emissions associated with construction activities at the affected facilities are necessary to control emissions from heavy construction equipment and worker travel.

The following construction mitigation measures are required for each of the affected facilities whose operators choose to install NOx control equipment. If, at the time when each facility-specific project is proposed in response to the proposed project, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project and determine if the project is covered by the analysis in this PEA. In addition, these mitigation measures will be included in a mitigation monitoring plan as part of issuing SCAQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by SCAQMD personnel.

<u>On-Road Mobile Sources</u>

AQ-1 Develop a Construction Emission Management Plan for each affected facility to minimize emissions from vehicles including, but not limited to: consolidating truck deliveries; scheduling deliveries to avoid peak hour traffic conditions; describing truck routing; describing deliveries including logging delivery times; describing entry/exit points; identifying locations of parking; identifying construction schedule; and prohibiting truck idling in excess of five consecutive minutes or another time-frame as allowed by the California Code of Regulations, Title 13 §2485 - CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. The Construction Emission Management Plan shall be submitted to SCAQMD CEQA for approval prior to the start of construction. At a minimum the Construction Emission Management Plan would include the following types of mitigation measures.

<u>Off-Road Mobile Sources:</u>

AQ-2 Maintain construction equipment 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.

AQ-4 For all construction areas that are demonstrated to be served by electricity, use electricity for on-site mobile equipment instead of diesel equipment to the extent feasible. For example, electric welders should be used in lieu of diesel or gasoline-fueled welders and onsite electricity should be used in lieu of temporary power generators. If electricity is not available, use alternative fuels where feasible.

AQ-5 Construction equipment shall incorporate, where feasible, emissions-reducing technology such as hybrid drives and specific fuel economy standards

AQ-6 All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier-4 off-road emission standards at a minimum. In addition, if not already supplied with a factory-equipped diesel particulate filter, all construction equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. In the event that any equipment required under this mitigation measure is not available, the project proponent shall provide documentation 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 defined in SCAQMD Rule 701.

If, at the time when each facility-specific project is proposed in response to the proposed project, that improved emission reduction technologies become available for on- and off-road construction equipment, as part of the CEQA evaluation for the facility-specific project, the construction mitigation measures will be updated accordingly.

4.2.3.3 Remaining Construction Impacts After Mitigation

The air quality analysis concluded that significant adverse construction air quality impacts could be created by the proposed project because future construction activities, either for construction occurring in the same year or over a five year period, indicate that emissions from NOx, VOC, CO, PM10, and PM2.5 would exceed the SCAQMD's applicable significance thresholds for the respective pollutants. The air quality analysis also concluded that significant adverse construction air quality impacts could be created by the proposed project because future construction activities occurring over a seven year period indicate that emissions from NOx, PM10, and PM2.5 would exceed the SCAQMD's applicable significance thresholds for the respective pollutants.

Since it is expected that construction activities may occur as a consequence of implementing the proposed project, construction air quality impacts were concluded to be significant. In spite of implementing the above mitigation measures, construction air quality impacts would likely remain significant. Thus, because the proposed project overall has the potential to generate significant adverse air quality impacts for construction, even after applying mitigation, a Statement of Findings and a Statement of Overriding Considerations will be prepared for the Governing Board's consideration and approval prior to the public hearing for the proposed project.

4.2.3.4 Operation Analysis

Implementation of the proposed project is expected to result in direct air quality benefits from the reduction of 14 tons per day of NOx RTCs by 2022. Because of the RECLAIM market system, the actual reduction in NOx emissions each year may be less than the reduction in RTC holdings imposed by the project. However, emissions may be generated by the operation of the add-on air pollution control devices (as GHGs) due to increased electricity and water use, increased wastewater disposal, and amortized GHG emissions from construction. In addition, emissions of criteria pollutants and GHGs may be generated from offsite vehicles used for delivering fresh materials needed for operations (e.g., chemicals, fresh catalyst, etc.) and for hauling away solid waste for disposal or recycling (e.g., spent catalyst). Finally, since SCR technology utilizes ammonia, a Toxic Air Contaminant (TAC), some emissions of ammonia slip are expected for operation of SCR units.

Non-Refinery Facilities

The operation of each air pollution control device that may be installed at the 11 non-refinery facilities is not expected to generate criteria pollutant emissions but rather to lessen the amount of NOx generated by the existing equipment/emission sources. However, secondary criteria pollutant emissions are expected to be generated as part of operation activities associated with operating and maintaining the air pollution control equipment after it is installed. In particular, the following activities may be sources of secondary criteria pollutant emissions during operation: 1) vehicle trips via heavy-duty truck for periodic ammonia/urea deliveries for each SCR and Ultracat filtration unit installed; 2) vehicle trips via heavy-duty truck for periodic deliveries of absorbent, catalyst, and replacement filters as well as solid waste hauling of spent filters for each Ultracat filtration unit installed. A summary of these heavy-duty truck trips are presented in Table 4.2-16.

Table 4.2-16

Heavy-Duty Truck Trips at 11 Non-Refinery Facilities

Heavy-Duty Truck Trips	NH3/Urea Delivery Trips[1]	Adsorbent Delivery Trips [1,2]	Solid Waste Haul Trips[1]	Filter Waste Haul Trips[1]	Catalyst Delivery Trips[3]	Total Trips
Annual	437	5	11	1	11	465
Peak Daily	11	1	1	1	11	25

[1] Peak daily trips assumed one ammonia/urea delivery occurs at each non-refinery facility and adsorbent, solid waste and filter waste haul trips occurs on the same day.

[2] Adsorbent, solid waste and filter waste based on vendor estimates for SOx portion of Ultracat system.

[3] Only five catalyst delivery trips are expected because catalysts are replaced every two to three years.

Secondary operational emissions from the 11 non-refinery facilities were estimated using EMFAC2011 emission factors. In addition to heavy-duty truck trips, that analysis assumes that one medium-duty round-trip for control system maintenance personnel may be needed for each of the 11 non-refinery facilities. Based on the locations of disposal sites and ammonia suppliers relative to the locations of the affected facilities, default truck trip distances were assumed to be 80 miles round-trip, except that truck trip distances to deliver ammonia were assumed to be 100 miles round-trip.

As analyzed in Subchapter 4.3 (Energy), the add-on air pollution control devices anticipated to be installed pursuant to the proposed project will require electricity to operate. A total increase in energy demand of 45,344 kWh/day (or 45.3 MWh/day) for 11 non-refinery facilities (see Table 4.3-8 in Subchapter 4.3 – Energy) is estimated, thus requiring an increase in electricity generation from the electric generating utility local to the affected facility due to the proposed project. Because affected facilities are located throughout the SCAQMD jurisdiction, it is not possible to determine which specific utility will be impacted. However, utilities typically operate either combined cycle turbines (*assembly of heat engines that work in tandem from the same source of heat*) or simple cycle turbines (*one power cycle with no provision for waste heat recovery*). Because they are less efficient, the simple cycle turbine has higher emission factors so tend to generate higher criteria pollutant emissions. Thus, for a "worst-case" impact scenario and due to the unknown source of electricity generation, the simple cycle turbine emission factors (provided in the footnote to Table 4.2-17) are used to estimate criteria pollutant impact from operation of the air pollution control devices.

Secondary operational emissions from the non-refinery affected facilities are presented in Table 4.2-17.

Table 4.2-17

Peak Daily Operational Emissions from 11 Non-Refinery Facilities

Source	**No of Trips**	**Distance** (round trip miles/day)	**VOC** (lb/day)	**CO** (lb/day)	**NOx** (lb/day)	**SOx** (lb/day)	**PM10** (lb/day)	**PM2.5** (lb/day)
Heavy-Duty Truck	25	100	0.88	3.73	24.50	0.06	1.43	0.92
Medium-Duty Truck	11	80	0.29	1.40	8.58	0.02	0.37	0.23
Electric Generation[4]	--	--	0.91	3.63	4.08	--	2.72	2.69
		TOTAL	**2**	**9**	**37**	**0.07**	**5**	**4**
		Significance Threshold	55	550	55	150	150	55
		Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As explained in Chapter 2 of this PEA, SCR and Ultracat filtration systems reduce NOx emissions by using ammonia, which is a toxic air contaminant (TAC). Unreacted ammonia emissions generated from these units are referred to as ammonia slip. Ammonia slip is limited to five parts per million (ppm) by permit condition. Based on the June 2015 Staff Report for SCAQMD Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools, and SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources, the concentration at a receptor located 25 meters from a stack would be much less than one percent of the concentration at the release from the exit of the stack. Thus, the peak concentration of ammonia at a receptor located 25 meters from a stack is calculated by assuming a dispersion of one percent. While ammonia does not have an OEHHA approved cancer potency value, it does have non-carcinogenic chronic (200 µg/m^3) and acute (3,200

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[4] Simple Cycle Turbine Emission Factors: NOx (0.09 lbs/MWh); CO (0.08 lbs/MWh); VOC (0.02 lbs/MWh); PM10 (0.06 lbs/MWh) - *Example Calculation*: NOx: 0.09 lbs/MWh x 45.3 MWh = 4.08 lbs

μg/m^3) reference exposure levels (RELs). Table 4.2-18 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds; both were shown to be less than significant.

Table 4.2-18

Health Risk from the Non-Refinery Facilities Using Ammonia

Ammonia Slip Concentration at the Exit of the Stack (ppm)	**Peak Concentration at a Receptor 25 m from the Stack** (μg/m^3)	**Acute REL** (μg/m^3)	**Chronic REL** (μg/m^3)	**Acute Hazard Index**	**Chronic Hazard Index**
5	35	3,200	200	**0.01**	**0.17**
		Significance Threshold		**1.0**	**1.0**
		Exceed Significance?		**NO**	**NO**

Even if multiple SCRs are installed at one non-refinery facility, the locations of all the stacks would not be situated in the same place within the affected facility's property. As such, even with multiple SCR installations, the acute and chronic hazard indices would not be expected exceed the significance threshold.

The peak number of heavy-duty truck trips that may occur at one non-refinery facility (Facility 8) in one year is 149. Heavy-duty trucks are prohibited from idling for more than five minutes at any one location, but they can move to multiple locations and idle at each location for up to five minutes. Thus, for a conservative analysis, the analysis assumes that the trucks may idle for up to a total of 15 minutes per trip. Therefore, a peak of approximately 37 hours of idling may occur at one facility in one year. The CARB emission factor for an idling heavy-duty truck is 1.67 grams per hour of diesel particulate matter. Therefore, 6.88×10^{-5} ton of diesel particulate exhaust per year would be generated per year at an affected non-refinery facility. Based on the Tier II methodology described in the SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.0 dated June 5, 2015, 6.88×10^{-5} ton of diesel particulate exhaust per year would generate a health risk of 1.5 in one million, which is less than the significance threshold of an increased probability of 10 cancer cases in one million.

Refinery Facilities

The operation of each air pollution control device that may be installed at the nine refinery facilities is also not expected to generate criteria pollutant emissions but rather to lessen the amount of NOx generated by the existing equipment/emission sources. However, as with the analysis for the non-refinery facilities, secondary criteria pollutant emissions are expected to be generated as part of operation activities associated with operating and maintaining the air pollution control equipment after it is installed. In particular, the following activities may be sources of secondary criteria pollutant emissions during operation: 1) vehicle trips via heavy-duty truck for periodic deliveries of ammonia for each SCR installed, NaOH for three LoTOx™ WGSs installed, hydrated lime for two Ultracat DGSs installed, and oxygen for every LoTOx™ unit installed; 2) vehicle trips via heavy-duty truck for periodic deliveries of catalyst and replacement filters as well as solid waste hauling of spent filters for each SCR unit installed; and 3) via heavy-duty truck hauling solid waste generated by each scrubber (WGS and DGS) installed. A summary of these heavy-duty truck trips are presented in Table 4.2-19.

Table 4.2-19
Heavy-Duty Operational Truck Trips at 9 Refinery Facilities

	Number of Heavy-Duty Truck Trips								
	NH3[1]	**NaOH[1]**	**Hydrated Lime[1]**	**Soda Ash[1]**	**Oxygen[1]**	**Fresh Catalyst[2]**	**Solid Waste[1]**	**Spent Catalyst[2]**	**TOTAL**
Annual	498	56	26	21	44	49	96	49	839
Peak Daily	17	3	1	4	1	16	7	16	65

[1] Peak daily trips assumed one heavy-duty truck trip occurs at each refinery facility for each chemical delivery or waste/spent catalyst haul trip.
[2] SCR fresh catalyst delivery trips are expected when the SCR is first built and then replaced every five years. Similarly, spent catalyst waste is also generated every five years.

Secondary operational emissions from the nine refinery facilities were estimated using EMFAC2011 emission factors. Based on the locations of disposal sites and chemical suppliers relative to the locations of the affected refineries, default round-trip truck distances were assumed to be: 1) 200 miles for solid waste hauling; 2) 50 miles for soda ash deliveries; 3) 100 miles for ammonia deliveries; 4) 100 miles for fresh catalyst deliveries; 5) 100 miles for spent catalyst hauling; 6) 66.2 miles for hydrated lime deliveries; 7) 50 miles for NaOH deliveries; and 8) 50 miles for oxygen deliveries.

As previously discussed for non-refinery facilities, Subchapter 4.3 (Energy) analyzed potential energy demand from the operation of add-on air pollution control devices anticipated to be installed pursuant to the proposed project. A total increase in energy demand for 9 refinery facilities is 168,170 kWh/day (or 168.2 MWh/day) (see Table 4.3-7 in Subchapter 4.3 – Energy), thus requiring an increase in electricity generation from the local power plants servicing the affected facilities due to the proposed project. Because affected facilities are located throughout the SCAQMD jurisdiction, it is not possible to determine which specific utility will be impacted. Similar to the calculations conducted for the non-refinery facilities (see Table 4.2-17), the simple cycle turbine emission factors (see footnote for Table 4.2-20) are used to estimate criteria pollutant impact from the operation of the air pollution control devices at the 9 refinery facilities because simple cycle turbine emission factors are higher than combined cycle turbine emission factors. By doing so, the air quality analysis is based on a “worst-case” impact scenario.

Secondary operational emissions from the refinery affected facilities are presented in Table 4.2-20.

Table 4.2-20
Peak Daily Operational Emissions from 9 Refinery Facilities

Vehicle Type	**No of Trips**	**Distance** (round trip miles/day)	**VOC** (lb/day)	**CO** (lb/day)	**NOx** (lb/day)	**SOx** (lb/day)	**PM10** (lb/day)	**PM2.5** (lb/day)
Heavy-Duty Truck	65	8,166	11.86	53.12	138.04	0.33	6.93	5.69
Electric Generation[5]	--	--	3.36	13.45	15.14	--	10.09	9.89
		TOTAL	**15**	**67**	**153**	**0**	**17**	**16**
		Significance Threshold	55	550	55	150	150	55
		Exceed Significance?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**

Emission sources associated with the operational-related activities as a result of implementing the proposed project may emit toxic air contaminants (TACs). For example, as explained in Chapter 2 of this PEA, SCR and Ultracat filtration systems reduce NOx emissions by using ammonia, which is a TAC. Unreacted ammonia emissions generated from these units are referred to as ammonia slip. Ammonia slip is limited to five parts per million (ppm) by permit condition. Based on the June 2015 Staff Report for SCAQMD Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools, and SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources, the concentration at a receptor located 25 meters from a stack would be much less than one percent of the concentration at the release from the exit of the stack. Thus, the peak concentration of ammonia at a receptor located 25 meters from a stack is calculated by assuming a dispersion of one percent. While ammonia does not have an OEHHA approved cancer potency value, it does have non-carcinogenic chronic (200 $\mu g/m^3$) and acute (3,200 $\mu g/m^3$) reference exposure levels (RELs). Table 4.2-21 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds; both were shown to be less than significant.

Table 4.2-21
Health Risk from Refinery Facilities Using Ammonia

Ammonia Slip Concentration at the Exit of the Stack (ppm)	**Peak Concentration at a Receptor 25 m from the Stack** ($\mu g/m^3$)	**Acute REL** ($\mu g/m^3$)	**Chronic REL** ($\mu g/m^3$)	**Acute Hazard Index**	**Chronic Hazard Index**
5	35	3,200	200	**0.01**	**0.2**
		Significance Threshold		**1.0**	**1.0**
		Exceed Significance?		**NO**	**NO**

[5] Simple Cycle Turbine Emission Factors: NOx (0.09 lbs/MWh); CO (0.08 lbs/MWh); VOC (0.02 lbs/MWh); PM10 (0.06 lbs/MWh) - *Example Calculation*: NOx: 0.09 lbs/MWh x 168.2 MWh = 15.14 lbs

Even if multiple SCRs are installed at one refinery facility, the locations of all the stacks would not be situated in the same place within the affected facility's property. As such, even with multiple SCR installations, the acute and chronic hazard indices would not be expected exceed the significance threshold.

In addition, diesel particulate matter from the exhaust of diesel-fueled heavy duty trucks is also a TAC. The analysis estimates that a peak of 147 heavy-duty truck trips may occur at a single facility in one year (e.g., at Facility 6). Heavy-duty trucks are expected to idle for up to 15 minutes per trip. Therefore, up to 37 hours of idling may occur at a single facility. The CARB emission factor for an idling heavy-duty truck is 1.67 grams per hour of diesel particulate matter. Therefore, a peak of 6.78×10^{-5} ton of diesel particulate exhaust per year would be generated at one refinery facility. Based on the Tier II methodology described in the SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.0 dated June 5, 2015, 6.78×10^{-5} ton of diesel particulate exhaust per year would generate a health risk of 1.5 in one million, which is less than the significance threshold of an increased probability of 10 cancer cases in one million.

Lastly, caustic may be used in the operation of three WGSs. With the potential for the installation of eight WGSs that utilize caustic, a maximum of eight caustic storage tanks may be installed. There are several types of caustic solutions that can be used in WGS operations, but sodium hydroxide (NaOH) is the most commonly used. Due to facility-specific information about their respective processes, three facilities are estimated to install three WGSs (one each) that utilize NaOH. NaOH is a TAC that is a non-cancerous but acutely hazardous substance. For "worst-case" operations, 5.84 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate three WGSs. Again, due to facility-specific information about their respective processes, the remaining five of the eight facilities that were assumed to install WGSs were projected to have an increased demand in caustic that is made of sodium carbonate (Na2CO3) which is commonly known as soda ash, a non-toxic, non-cancerous, and non-hazardous substance.

Even though the facilities that may be affected by the proposed project may already use NaOH elsewhere in their facilities, for the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for each WGS installed. Thus, for three WGSs, three 10,000 gallon NaOH storage tanks was assumed to be constructed. As summarized in Table 4.2-22, for each facility that was projected to increase the use in the acutely hazardous substance NaOH, the filling loss and the working loss of each NaOH tank were calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters).

Table 4.2-22
Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)	Significant?
2	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO	NO
4	0.45	1.01E-04	3.04E-04	4.06E-04	4.00E-03	NO	NO
9	2.02	4.57E-04	1.37E-03	1.83E-03	4.00E-03	NO	NO
Total	**5.84**						

None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities. It is important to note that the toxics analysis is a localized analysis and because of the distances between the affected facility locations, the NaOH emission impacts would not overlap. Thus, because the screening level for NaOH was not exceeded for either of the affected facilities, no significant air quality operational impacts with respect to the use of NaOH are expected from the proposed project. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed.

Combined Operation Emissions From Both Non Refinery and Refinery Facilities

Table 4.2-23 presents the peak daily emissions from operating control equipment at all 20 facilities (e.g., 11 non-refinery facilities plus nine refinery facilities) at full build out.

Table 4.2-23
Peak Daily Overlapping Non-Refinery and Refinery Emissions
from Operating Various NOx Control Equipment in Same Year

Operation Activity	**VOC** (lb/day)	**CO** (lb/day)	**NOx** (lb/day)	**SOx** (lb/day)	**PM10** (lb/day)	**PM2.5** (lb/day)
Delivery and Haul Trips at 11 Non-Refineries	1.17	5.13	33.10	0.07	1.80	1.14
Delivery and Haul Trips at 9 Refineries	11.86	53.12	138.04	0.33	6.93	5.69
Electricity Generation (for 11 Non-Refineries)	0.91	3.63	4.08	--	2.72	2.69
Electricity Generation (for 9 Non-Refineries)	3.36	13.45	15.14	--	10.09	9.89
Benefit from NOx Control Equipment*	0	0	-17,580	0	0	0
TOTAL	**17**	**75**	**-17,390**	**0.4**	**22**	**19**
Significance Threshold	55	550	55	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

* A negative number denotes an emission *reduction* (or benefit to air quality)

The calculations show the total daily operation emissions due to delivery and haul trips and electricity generation exceed the SCAQMD's CEQA air quality significance threshold of 55 pounds of NOx per day. However, because there will be an overall reduction in NOx emissions of 8.79 tons per day (*or 17,580 lbs per day*) during the operational phase due to the operation of NOx air pollution control equipment, the net NOx emissions impact will result in an overall reduction in NOx emissions creating an air quality benefit. Appendix E contains the spreadsheets with the results, assumptions, and methodologies used by the SCAQMD staff for this analysis.

With regard to odors currently, for all diesel-fueled vehicles that may be utilized during operation activities at both non-refinery and refinery facilities, the diesel fuel is required to have a low sulfur content (e.g., 15 ppm by weight or less) in accordance with SCAQMD Rule 431.2 – Sulfur Content of Liquid Fuels. Because the deliveries of supplies and the removal of solid waste for both non-refinery and refinery facilities will occur within the confines of existing affected facilities, sufficient dispersion of diesel emissions over distance generally occurs such that odors associated with diesel emissions may be discernable to offsite receptors, depending on the location of the equipment and its distance relative to the nearest offsite receptor. Further, the use of diesel-fueled trucks as part of operation activities will not be allowed to idle longer than fifteen minutes at the affected facilities once onsite, so odors from these vehicles would not be expected. Thus, the proposed project is not expected to create significant adverse objectionable odors during operation. Since no significant impacts were identified for this issue, no mitigation measures are necessary or required.

4.2.3.5 Operation Mitigation

The analysis indicates that there will be an overall reduction in NOx emissions during the operational phase of the proposed project. Further, no other pollutant emissions exceed the applicable significance thresholds during operation for the proposed project. Thus, because there are no significant adverse air quality impacts with the operational phase of the proposed project, no air quality mitigation measures are required.

4.2.3.6 Remaining Operation Impacts After Mitigation

The air quality analysis concluded that potential operational air quality impacts would be less than significant, no mitigation measures were required, so operational air quality impacts remain less than significant.

4.2.4 Cumulative Air Quality Impacts

In general, the preceding analysis concluded that air quality impacts from construction activities would be significant from implementing the proposed project because the SCAQMD's significance thresholds for construction will be exceeded before mitigation for VOC, NOx, CO, PM10, and PM2.5. After mitigation, VOC, NOx, CO, PM10, and PM2.5emissions will also exceed the SCAQMD's significance thresholds for construction. Thus, the air quality impacts due to construction are considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, generate significant adverse cumulative air quality impacts. It should be noted, however, that the air quality analysis is a conservative, "worst-case" analysis so the actual construction impacts are not expected to be as great as estimated here. Further, the construction activities are temporary when compared to the permanent projected long-term emission reductions of NOx as a result of the proposed project.

The analysis also indicates that, in addition to the overall reduction in NOx emissions, the proposed project will result in less than significant increases of VOC, CO, NOx, PM10 and PM2.5 emissions during the operational phase of the proposed project. Because operational emissions do not exceed the project-specific air quality significance thresholds, which also serve as the cumulative significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)). Further, the amount of emission reductions to be achieved by the proposed project for NOx will, at the very least, meet the emission reduction projections and commitments made in the AQMP. Even though the proposed project will cause a temporary and significant adverse increase in air emissions during the construction phase and less than significant increases in air emissions during the operation phase, the temporary net increase in construction emissions combined with the total permanent emission reductions projected overall during operation would not interfere with the air quality progress and attainment demonstration projected in the AQMP. Further, based on regional modeling analyses performed for the 2012 AQMP, implementing control measures contained in the 2012 AQMP, in addition to the air quality benefits of the existing rules, is anticipated to bring the District into attainment with all national and most state ambient air quality standards by the year 2023. Therefore, cumulative operational air quality impacts from the proposed project, previous amendments and all other AQMP control measures considered together, are not expected to be significant because implementation of all AQMP control measures is expected to result in net emission reductions and overall air quality improvement. This determination is consistent with the conclusion in the 2012 AQMP Final Program EIR that cumulative air quality impacts from all AQMP control measures are not expected to be significant (SCAQMD, 2012). Therefore, there will be no significant cumulative adverse operational air quality impacts from implementing the proposed project.

Though the proposed project involves combustion processes which could generate GHG emissions such as CO2, CH4, and N2O, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs. Relative to GHGs, implementing the proposed project is expected to increase GHG emissions that exceed the SCAQMD's GHG significance threshold for industrial sources. In addition, implementing the proposed project is expected to generate significant adverse cumulative GHG air quality impacts. The GHG analysis for the proposed project can be found in the Section 4.2.6 – Greenhouse Gas Impacts.

4.2.5 Cumulative Mitigation Measures

The analysis indicates that, in addition to the overall reduction in NOx emissions, the proposed project will result in less than significant increases of VOC, CO, NOx, PM10 and PM2.5 emissions during the operational phase of the proposed project. However, no pollutant emissions exceed the applicable significance thresholds during operation for the proposed project. Thus, there are no adverse significant cumulative air quality impacts with the operational phase of the proposed project and as such, no cumulative mitigation measures for operation are required.

The analysis also indicates that the VOC, NOx, CO, PM10, and PM2.5 emissions will exceed the applicable significance thresholds during construction. As a result, the proposed project is expected to have significant cumulative adverse construction air quality impacts. Mitigation measures that focus on the VOC, NOx, CO, PM10, and PM2.5 emissions that may be generated during construction are required to minimize the significant air quality impacts associated with construction activities. Therefore, feasible mitigation measures to reduce emissions associated with construction activities at the affected facilities are necessary to control emissions from heavy construction equipment and worker travel. While the mitigation measures may reduce emissions associated with construction activities at the affected facilities to the maximum extent feasible, none will avoid the significant impact or reduce the impact to less than significant.

The following construction mitigation measures are required for each of the affected facilities whose operators choose to install NOx control equipment. If, at the time when each facility-specific project is proposed in response to the proposed project, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project and determine if the project is covered by the analysis in this PEA. In addition, these mitigation measures will be included in a mitigation monitoring plan as part of issuing SCAQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by SCAQMD personnel.

<u>On-Road Mobile Sources</u>

AQ-1 Develop a Construction Emission Management Plan for each affected facility to minimize emissions from vehicles including, but not limited to: consolidating truck deliveries; scheduling deliveries to avoid peak hour traffic conditions; describing truck routing; describing deliveries including logging delivery times; describing entry/exit points; identifying locations of parking; identifying construction schedule; and prohibiting truck idling in excess of five consecutive minutes or another time-frame as allowed by the California Code of Regulations, Title 13 §2485 - CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. The Construction Emission Management Plan shall be submitted to SCAQMD CEQA for approval prior to the start of construction. At a minimum the Construction Emission Management Plan would include the following types of mitigation measures.

<u>Off-Road Mobile Sources:</u>

AQ-2 Maintain construction equipment 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.

AQ-4 For all construction areas that are demonstrated to be served by electricity, use electricity for on-site mobile equipment instead of diesel equipment to the extent feasible. For example, electric welders should be used in lieu of diesel or gasoline-fueled welders and onsite electricity should be used in lieu of temporary power generators. If electricity is not available, use alternative fuels where feasible.

AQ-5 Construction equipment shall incorporate, where feasible, emissions-reducing technology such as hybrid drives and specific fuel economy standards

AQ-6 All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier-4 off-road emission standards at a minimum. In addition, if not already supplied with a factory-equipped diesel particulate filter, all construction equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. In the event that any equipment required under this mitigation measure is not available, the project proponent shall provide documentation 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.

If, at the time when each facility-specific project is proposed in response to the proposed project, that improved emission reduction technologies become available for on- and off-road construction equipment, as part of the CEQA evaluation for the facility-specific project, the construction mitigation measures will be updated accordingly.

4.2.6 Greenhouse Gas Impacts

Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities, appears to be closely associated with global warming. State law defines GHG to include the following: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) (HSC §38505(g)). The most common GHG that results from human activity is CO2, followed by CH4 and N2O.

Traditionally, GHGs and other global warming pollutants are perceived as solely global in their impacts and that increasing emissions anywhere in the world contributes to climate change anywhere in the world. A study conducted on the health impacts of CO2 "domes" that form over urban areas cause increases in local temperatures and local criteria pollutants, which have adverse health effects[6].

The analysis of GHGs is a different analysis than the analysis of criteria pollutants for the following reasons. For criteria pollutants, the significance thresholds are based on daily emissions because attainment or non-attainment is primarily based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health (e.g., one-hour and eight-hour standards). Since the half-life of CO2 is approximately 100 years, for example, the effects of GHGs occur over a longer term which means they affect the global climate over a relatively long time frame. As a result, the SCAQMD's current position is to evaluate the effects of GHGs over a longer timeframe than a single day (i.e., annual emissions). GHG emissions are typically considered to be cumulative impacts because they contribute to global climate effects. GHG emission impacts from implementing the proposed project were calculated at the project-specific level during construction and operation. For example, installation of NOx control equipment has the potential to increase the use of electricity, fuel, and water and the generation of wastewater which will in turn increase CO2 emissions.

The SCAQMD convened a "Greenhouse Gas CEQA Significance Threshold Working Group" to consider a variety of benchmarks and potential significance thresholds to evaluate GHG impacts. On December 5, 2008, the SCAQMD adopted an interim CEQA GHG Significance Threshold for projects where SCAQMD is the lead agency (SCAQMD, 2008). This interim threshold is set at 10,000 metric tons of CO2 equivalent emissions (MTCO2eq) per year. The SCAQMD prepared a "Draft Guidance Document – Interim CEQA GHG Significance Thresholds" that outlined the approved tiered approach to determine GHG significance of projects (SCAQMD, 2008, pg. 3-10). The first two tiers involve: 1) exempting the project because of potential reductions of GHG emissions allowed under CEQA; and, 2) demonstrating that the project's GHG emissions are consistent with a local general plan. Tier 3 proposes a limit of 10,000 MTCO2eq per year as the incremental increase representing a significance threshold for projects where SCAQMD is the lead agency (SCAQMD, 2008, pg. 3-11). Tier 4 (performance standards) is yet to be developed. Tier 5 allows offsets that would reduce the GHG impacts to below the Tier 3 brightline threshold. Projects with incremental increases below this threshold will not be cumulatively considerable.

As indicated in Chapter 3, combustion processes generate GHG emissions in addition to criteria pollutants. The following analysis mainly focuses on directly emitted CO2 because this is the primary GHG pollutant emitted during the combustion process and is the GHG pollutant for which emission factors are most readily available. CO2 emissions were estimated using emission factors from CARB's EMFAC2011 and OFFROAD2011 models and USEPA's AP-42. In addition, CH4 and N20 emissions were also estimated and are included in the overall GHG calculations. No other GHGs are expected to be emitted because the proposed project does not

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[6] Jacobsen, Mark Z. "Enhancement of Local Air Pollution by Urban CO2 Domes," Environmental Science and Technology, as describe in Stanford University press release on March 16, 2010 available at: http://news.stanford.edu/news/2010/march/urban-carbon-domes-031610.html.

affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs.

Installation of NOx control equipment as part of implementing the proposed project is expected to generate construction-related CO2 emissions. In addition, based on the type and size of equipment affected by the proposed project, CO2 emissions from the operation of the NOx control equipment are likely to increase from current levels due to using electricity, fuel and water and generating more wastewater. The proposed project will also result in an increase of GHG operational emissions produced from additional truck hauling and deliveries necessary to accommodate the additional solid waste generation and increased use of chemicals and supplies.

For the purposes of addressing the potential GHG impacts of the proposed project, the overall impacts of CO2e emissions from the project were estimated and evaluated from the earliest possible initial implementation of the proposed project with construction beginning in 2016. Once the proposed project is fully implemented, the potential NOx emission reductions would continue through the end of the useful life of the equipment. The analysis estimated CO2e emissions from all sources subject to the proposed project (construction and operation) from the beginning of the proposed project (2016) to the end of the project (2022). The beginning of the proposed project was assumed to be no sooner than 2016, since installing NOx control equipment takes considerable advance planning and engineering. Full implementation of the proposed project is expected to occur by the end of 2022 when the entire 14 tons per day of the NOx RTC shave is completed such that any installed or modified NOx controls could be constructed and operational by this final date. Thus, once construction is complete and the equipment is operational, CO2e emissions will remain constant.

GHG emissions from the 11 non-refinery and nine refinery facilities were quantified by applying the same assumptions used to quantify the criteria pollutant emissions. The only exception is that the construction GHG emissions were amortized over a 30-year project life in accordance with the guidance provided in the Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans[7] that was adopted by the SCAQMD Governing Board in December 2008.

For the non-refinery facilities, approximately 325 amortized[8] metric tons per year (MT/year) of GHGs (as carbon dioxide equivalent emissions or CO2e) would be generated from construction-related activities that may occur at the affected non-refinery facilities in response to implementing the proposed project. Similarly, approximately 77 MT/year of GHG emissions would be generated from operation-related activities (e.g., truck trips) that may occur at the non-refinery facilities in response to implementing the proposed project. The generation of electricity needed to operate the air pollution control devices is calculated based on the assumption a simple cycle turbine is increasing operation to fulfill additional demand. Simple cycle turbines have higher emission factors than combined cycle turbines so the results are more "worst case."

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[7] Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans, http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf?sfvrsn=2

[8] To amortize GHGs from temporary construction activities over a 30-year period (*est. life of the project/ equipment*), the amount of CO2e emissions during construction are calculated and then divided by 30.

Based on the energy needs from non-refinery facilities at 45.3 MWh/day (see Table 4.3-8 in Subchapter 4.3 – Energy), the GHG emissions from electric generation is 7,866 MT/year[9]. It should be noted that unlike refinery facilities, the control equipment at non-refinery facilities do not generate water demand or wastewater, thus are not included in the GHG calculations.

In total, 8,268 MT/year of GHG emissions would be generated by construction and operation activities at the 11 non-refinery facilities, should these facility operators choose to install NOx control technology in response to the proposed project. The total amount of GHG emissions that may be generated from operation activities at all affected non-refinery facilities is less than the GHG significance threshold of 10,000 MT/year.

In addition, for the nine refinery facilities, approximately 1,373 amortized MT/year of GHGs as CO2e would be generated from construction-related activities that may occur at the affected refinery facilities in response to implementing the proposed project. Similarly, approximately 194 MT/year of GHG emissions would be generated from operation-related activities (e.g., truck trips) that may occur at the refinery facilities in response to implementing the proposed project. Further, because WGSs utilize water and generate wastewater during operation, GHG emissions may be created from the increased use of water and the increased generation of wastewater from WGS operation activities. As such, approximately 813 MT/yr of CO2e from increased water use and 319 MT/year of CO2e from increased wastewater generation would be expected if WGSs are installed and operated as a result of implementing the proposed project. Lastly, because operation of all of the NOx control technologies require electricity, approximately 30,818 MT/year of CO2e may be generated if all refinery facilities install NOx control equipment. In total, 33,517 MT/year of CO2e emissions would be generated by construction and operation activities occurring at the nine refinery facilities, should these facility operators choose to install NOx control technology in response to the proposed project. The total amount of GHG emissions that may be generated from operation activities at refinery facilities is greater than the GHG significance threshold of 10,000 MT/year and thus, would be considered a significant adverse GHG emissions impact.

Table 4.2-24 summarizes the unmitigated CO2e impacts from both construction activities and operation activities per refinery facility.

[9] Simple cycle turbine GHG emission factor: 1,049 lbs/MWhr
Calculation: 1,049 lbs/MWhr x 45.3 MWhr/day x 365 days/year ÷ 2,205 MT/lbs = 7,866 MT/year

Table 4.2-24
Overall Unmitigated CO2e Increases Due to Construction and Operation Activities per Refinery Facility (metric tons/year)[1]

Refinery Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)**[2] (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2e** (MT/yr)
1	313	7,522	94	19	26	7,974
2	82	2,116	55	23	12	2,288
3	31	296	0	0	2	329
4	97	4,582	66	30	14	4,789
5	363	4,504	295	133	37	5,332
6	181	3,984	148	66	35	4,414
7	85	1,487	0	0	16	1,588
8	85	2,605	94	19	19	2,822
9	136	3,723	59	30	32	3,980
TOTAL	**1,373**	**30,818**	**813**	**319**	**194**	**33,517**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.

It is important to note that none of the affected facilities individually exceed the industrial GHG significance threshold of 10,000 MT/day. However, the GHG emissions from the refinery sector exceed the threshold and therefore, the proposed project is considered to have adverse significant GHG impacts for the refinery sector.

After combining the GHG emissions from the non-refinery and refinery sectors, in total, 41,785 MT/year of CO2e emissions would be generated by construction and operation activities occurring at all 11 of the non-refinery facilities and nine refinery facilities, should these facility operators choose to install NOx control technology in response to the proposed project. Thus, the overall GHG emissions from combining both sectors exceed the GHG significance threshold and therefore, the proposed project is considered to have significant adverse GHG impacts.

Because the proposed project is expected to generate construction-related CO2 emissions, and the operational phase of the proposed project is also expected to generate additional GHG emissions, adverse significant GHG cumulative impacts from the proposed project are expected. If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the significant adverse impacts (CEQA Guidelines §15126.4). Mitigation measures focus on the GHG emissions. Therefore, feasible mitigation measures to reduce GHG emissions at the affected facilities are necessary.

4.2.7 Greenhouse Gas Mitigation Measures

If the proposed project is implemented, the analysis indicates that there will be a significant increase in GHG emissions. Because adverse significant GHG impacts are expected from the proposed project, feasible GHG mitigation measures are required. While none of the affected facilities individually exceed the industrial GHG significance threshold of 10,000 MT/day, individual facilities may be able to offset their increases in GHG emissions through CARB's AB 32 cap-and-trade program. Cap-and-trade is a market-based regulation that is designed to reduce GHGs from multiple sources by setting a firm limit or cap on GHGs and minimize the compliance costs of achieving AB 32 goals. The cap will decline approximately three percent each year from 2015 to 2020. Every year, facilities in the cap-and-trade program turn in allowances and offsets for 30 percent of previous year's GHG emissions. Also, for each compliance period, facilities in the cap-and-trade program turn in allowances and a limited number of offsets to cover the remainder of emissions in that compliance period. Finally, if the compliance deadline is missed or there is a shortfall, four allowances must be provided for every ton of emissions that was not covered in time. All nine refineries and 10 out of the 11 non-refinery facilities that may be affected by the proposed project are in the CARB's AB 32 cap-and-trade program for GHGs, so their GHG emissions, including any individual facility increases from the proposed project would be covered under that program.

For the one facility that is not in CARB's AB 52 cap-and-trade program (e.g., Facility 9), GHG emissions could potentially be mitigated through purchasing reductions via SCAQMD Regulation XXVII – Climate Change, which created the SoCal Climate Solutions Exchange. The SoCal Climate Solutions Exchange is a voluntary program where facilities in the district can undertake projects to voluntarily reduce GHG emissions in advance of any regulatory requirement. GHG mitigation measures for industrial sources are under development but there are some existing GHG reducing protocols that have been approved or adopted by various organizations and some of these are already used in the SCAQMD's SoCal Climate Solutions Exchange. In order to participate in the exchange, the GHG reductions need to be real, additional (surplus), quantifiable, verifiable, permanent over a specific time, and enforceable. These early reductions can be helpful to facilities that would need offsets for GHG mitigation.

In addition, the California Climate Action Registry (CCAR) is currently developing the following protocols: 1) bus rapid transit; 2) blended cement; 3) tidal wetland sequestration (farms converting to wetlands). CCAR is also evaluating several categories for potential protocol development, including waste diversion, local government operations, boiler efficiency; and truck stop electrification. CCAR has been asked to look at other areas, such as waste water biogas, natural gas pipelines, agricultural soil sequestration, and CO2 capture and storage, and those will be evaluated in the future.

In addition, the California Air Pollution Control Officers Association (CAPCOA) has suggested that lead agencies develop a "Green List of Projects" (Green List) to be consistent with and achieve the goals of AB 32 and to encourage projects that can provide overall GHG emission reduction benefits. Of the Green List projects, especially in consideration that compliance with the proposed project could result in the installation of water-intensive scrubbers, recycled water projects and the utilization of recycled water seem to be among the most direct ways to mitigate GHG emissions for the proposed project. Specifically, the energy it would take to treat and convey reclaimed water to a facility (e.g., 1,200 kWh/MMgallons[10]) is approximately 10 times less than the amount of energy it would take for potable water (e.g., 12,700 kWh/MMgallons[11]) to be supplied, conveyed and distributed. Thus, for each facility that will have future access to recycled water and uses reclaimed wastewater to satisfy the water demands for the proposed project and in turn, mitigate CO2eq emissions, less GHG emissions would be generated for the operational water use/conveyance and operational wastewater generation portions of the proposed project.

Based on the preceding discussion, the following mitigation measures will apply to any facility whose operator chooses to install NOx control equipment that utilizes water for its operation. If, at the time when each facility-specific project is proposed in response to the proposed project, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project and determine if the project is covered by the analysis in this PEA. In addition, these mitigation measures will be included in a mitigation monitoring plan as part of issuing SCAQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by SCAQMD personnel.

GHG-1 When NOx control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the NOx control equipment.

GHG-2 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to use their best efforts to submit a written declaration with the application for a Permit to Construct for the NOx control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

Tables 4.2-25 summarizes the mitigated CO2e impacts from both construction activities and operation activities per refinery facility and shows that if mitigation for water and wastewater is applied to Refineries 1, 5 and 6 should they utilize recycled water, a savings of GHG emissions of 685 MT/year may occur. It is important to note that none of the NOx control equipment contemplated for the non-refinery sector utilize water or would generate wastewater. Thus, utilizing recycled water to mitigate GHG emissions from the proposed project would only apply to certain refinery facilities whose operators choose to install NOx control equipment that utilize water (e.g., WGSs).

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[10] California's Water – Energy Relationship, Table 1-2, Page 9, California Energy Commission, Final Staff Report, CEC-700-2005-011-SF, November 2005. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

[11] California's Water – Energy Relationship, Table 1-3, Page 11, California Energy Commission, Final Staff Report, CEC-700-2005-011-SF, November 2005. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

Table 4.2-25
Overall Mitigated CO2e Increases Due to Construction and Operation Activities per Refinery Facility (metric tons/year)[1]

Refinery Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)**[2] (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2e** (MT/yr)
1	313	7,522	9	2	26	7,872
2	82	2,116	55	23	12	2,288
3	31	296	0	0	2	329
4	97	4,582	66	30	14	4,789
5	363	4,504	28	13	37	4,945
6	181	3,984	14	6	35	4,220
7	85	1,487	0	0	16	1,588
8	85	2,605	94	19	19	2,822
9	136	3,723	59	30	32	3,980
TOTAL	**1,373**	**30,818**	**326**	**121**	**194**	**32,832**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.

As demonstrated in Tables 4.2-24 and 4.2-25, none of the affected refinery facilities individually exceed the GHG industrial significance threshold of 10,000 MT/yr before or after mitigation. However, the GHG emissions from the project as a whole exceed the GHG threshold both before and after mitigation. Therefore, the proposed project is considered to have adverse significant GHG impacts after mitigation. Because the proposed project is expected to generate construction-related CO2e emissions, and the operational phase of the proposed project is also expected to generate additional GHG emissions, cumulative GHG adverse impacts after mitigation from the proposed project are considered significant.

While there may be additional measures that could eventually be imposed upon sources with potential increases in GHG emissions, CARB is adopting measures pursuant to AB 32 that would require the maximum technically feasible and cost-effective GHG emission reductions from most of the industry categories affected by the proposed project. CEQA Guidelines §15364 defines “feasible” as “capable of being accomplished in a successful manner within a reasonable period of time…” For example, CARB has adopted a Low Carbon Fuel Standard for motor vehicle fuels. In October 2010, CARB has also adopted a GHG reduction cap and trade program that will apply to projects that will need to receive permits, including any projects that may occur as a result of amending the NOx RECLAIM program. CARB GHG reduction measures are required to “achieve the maximum technologically feasible and cost-effective greenhouse gas reductions from sources or categories of sources” (Health and Safety Code §38560). CARB has published two scoping plans, as required by Health and Safety Code §38561, that identifies additional measures CARB intends to adopt that will reduce GHG emissions. The scoping plan is required to identify measures that will achieve “the maximum feasible and cost-effective reductions of greenhouse gas emissions by 2020.” (Health and Safety Code §38561 (b)).

All CARB GHG measures are required to meet the "maximum feasible and cost-effective" reductions test. This test is equally as stringent as the CEQA definition of "feasible." Given that CARB has been working on this statutory mandate for several years, and has an entire office and staff devoted to GHG rulemaking, it would not be feasible for SCAQMD staff to develop generally applicable GHG reduction measures that go beyond CARB measures. Thus, application of CARB rules will require the maximum feasible GHG reductions for existing sources.

EPA has stated that because there is no national ambient air quality standard for CO2, or any of the other primary GHGs, and EPA does not plan to promulgate any, the "nonattainment" NSR program that applies to criteria pollutants will not apply to GHGs[12]. However, for a NSR program that applies to attainment pollutants, prevention of significant deterioration (PSD) will also apply. PSD applies to any "major stationary source" of pollutants subject to regulation under the federal CAA. Accordingly, because EPA has promulgated its GHG reduction rules for motor vehicles, GHGs is a pollutant that is subject to regulation under the federal Clean Air Act. EPA has issued its interpretation that GHGs become regulated pollutants as of the time the motor vehicle rule becomes effective (i.e., January 2011). SCAQMD staff concluded at the time that it would not be feasible to begin requiring GHG BACT prior to January 2011, because it would be necessary to amend the agency's rules in order to do so.

EPA promulgated its GHG PSD rule requiring several "steps." In Step 1, which began on January 2, 2011, only facilities that would already be subject to Title V or PSD would be subject to GHG requirements under these programs. In addition, a facility modification would only trigger PSD for GHGs if the modification resulted in an increase of 75,000 MT/yr CO2eq. Therefore, SCAQMD began requiring GHG BACT for sources already subject to PSD and having a GHG increase of 75,000 MT/yr or more, effective January 2, 2011. In Step 2, which began on July 1, 2011, facilities with a potential to emit 100,000 MT/yr CO2eq or more would be subject to Title V and PSD, regardless of whether they would otherwise be subject to these programs as a result of emissions of other pollutants. Therefore, effective July 1, 2011, SCAQMD started requiring GHG BACT for all new and modified facilities having the potential to emit 100,000 MT/yr CO2eq and having an increase of at least 75,000 MT/yr CO2eq. Recently, the U.S. Supreme Court held that EPA was limited to Step 1.

At the local level, SCAQMD adopted Rule 1714 – Prevention of Significant Deterioration for Greenhouse Gases, implementing PSD requirements for GHGs. SCAQMD interprets its Rule 1714 to be consistent with the U.S. Supreme Court decision.

Although the definition of federal BACT for PSD sources is somewhat different from the definition of BACT that SCAQMD uses for nonattainment NSR, this definition is still at least as stringent as the CEQA definition of feasible. Pursuant to federal CAA §169(3) (42 U.S.C. §7479(3)), the term "best available control technology" means in pertinent part "an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the

[12] "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Proposed Rule" ("Tailoring Rule Proposal") 74 FR 55292, 55297 (October 27, 2009).

permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant." Therefore, GHG BACT is at least as stringent as CEQA's definition of feasible mitigation, which similarly allows consideration of economic, technological and environmental factors. Thus, application of BACT will require the maximum feasible reductions of GHGs at new or modified sources, which would otherwise be subject to PSD. Because the potential GHG increases at each affected facility are individually well below EPA's initial thresholds, GHG BACT would not be required for any of the individual facilities making facility modifications to comply with the proposed project.

Further, in light of the uncertainty associated with the effects of the proposed project on individual facilities whose operators have not submitted any applications for permits to construct as a result of the proposed project, the adoption and implementation of feasible mitigation beyond the requirement of using recycled water when available will not feasibly reduce significant air quality and climate change impacts to a less-than-significant level, because it would not be feasible for the SCAQMD to attempt to develop and impose additional GHG mitigation measures for the myriad of source categories that may be affected by the proposed project. Accordingly, the project-level and cumulative impacts identified as significant in this chapter cannot feasibly be mitigated to a less-than-significant level and remain significant and unavoidable.

SUBCHAPTER 4.3

ENERGY

4.3 ENERGY

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in energy impacts. The energy impact analysis in this PEA identifies the net effect on energy resources from implementing the proposed project.

4.3.1 Introduction

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of new or the modification of existing NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx at the affected facilities, which will provide air quality and human health benefits to the public. However, installing new or modifying existing air pollution control equipment is expected to have potentially adverse energy impacts.

The environmental analysis assumes that installation of NOx control technologies for the affected sources will reduce NOx emissions overall, but activities associated with both the installation of new control devices and the modification of existing control devices will create adverse energy impacts both during the period of its construction and through ongoing daily operations. During installation or modification of add-on air pollution control devices, energy impacts may be generated from the need for diesel fuel to operate onsite construction equipment and heavy-duty vehicles and for gasoline to operate offsite vehicles used for worker commuting. After construction activities are completed, increased use of electricity needed to operate the NOx air pollution control devices and diesel fuel needed to operate offsite vehicles used for delivering fresh materials needed for operations (e.g., supplies, chemicals, fresh catalyst, etc.) and hauling away solid waste for disposal or recycling (e.g., spent catalyst). No increased use of natural gas is expected because the NOx air pollution control devices identified in Table 4.0-2 do not utilize natural gas. The analysis of these impacts can be found in Section 4.3.3. Refer to Appendix E for the calculations used to estimate adverse energy impacts during construction and operation.

4.3.2 Significance Criteria

Impacts to energy resources will be considered significant if any of the following criteria are met:

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.

- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

4.3.3 Potential Energy Impacts and Mitigation Measures

Table 4.3-1 summarizes the estimated number of NOx emission control devices per sector and per equipment/source category. The different types of control devices include Selective Catalytic Reduction (SCR), a proprietary Low Temperature Oxidation technology (LoTOx™) with or without a Wet Gas Scrubber (WGS), and catalyst impregnated filters with a Dry Gas Scrubber (UltraCat DGS). In total, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx™ with WGSs, one LoTOx™ without WGS, and three UltraCat DGSs.

Table 4.3-1

Estimated Number of NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Number of Affected Facilities	Estimated Number of Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	5	2 SCRs 2 LoTOx™ with WGSs 1 LoTOx™ without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	5	5 LoTOx™ with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx™ with WGS or 1 UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	1	2 SCRs or 1 UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	1	1 SCR or 1 UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	1	1 SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	3	16 SCRs
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	7	13 SCRs and 1 SCR replacement
		TOTAL	**114 to 117 SCRs** **7 to 8 LoTOx™ with WGSs** **1 LoTOx™ without WGS** **0 to 3 UltraCat DGSs**

4.3.3.1 Energy Impacts During Construction

Implementation of the proposed project could potentially result in construction activities at 20 NOx RECLAIM facilities, which are complex industrial facilities. The physical changes that are expected focus on the installation of new or the modification of existing control equipment for the following stationary sources of NOx: 1) FCCUs; 2) refinery boilers and heaters; 3) refinery gas turbines; 4) SRU/TGUs; 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant ICEs; 8) container glass melting furnaces; 9) coke calcining; and, 10) metal heat treating furnaces. As previously summarized in Table 4.3-1, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx™ with WGSs, one LoTOx™ without WGS, and three UltraCat DGSs.

During installation or modification of add-on air pollution control devices, adverse energy impacts (e.g., increased demand in energy) may occur during construction due to the need for: 1) diesel fuel to operate onsite construction equipment that cannot utilize or access electricity; 2) diesel fuel to operate heavy-duty and medium-duty vehicles for delivering supplies and hauling waste during construction; and, 3) gasoline to operate offsite vehicles used for worker commuting. Tables 4.3-2 and 4.3-3 summarize the how much diesel fuel and gasoline will be need to construct an assortment of NOx control technologies (including the vehicles for deliveries, hauling and construction workers) at the 20 facilities for the refinery and non-refinery sectors, respectively. Table 4.3-4 summarizes the how much diesel fuel and gasoline will be needed to construct all NOx control equipment at all 20 facilities combined.

To determine whether a project would cause a substantial depletion of existing energy resource supplies for diesel fuel and gasoline, the SCAQMD determines significance for increased fuel use by comparing the potential increases in diesel fuel and gasoline to one percent of supply for each fuel type. As shown in Table 4.3-4, the increased use of diesel fuel and gasoline during construction would not exceed the significance threshold of one percent of supply. As such, these projected increased usages of diesel fuel and gasoline would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, these projected increased usages of diesel fuel and gasoline would not create any significant effects on peak and base period demands on the availability of diesel fuel and gasoline.

As part of the installing or modifying existing air pollution control equipment, electricity could be utilized to operate certain construction equipment in lieu of diesel, such as welders, if access to electricity is available. (In fact, utilizing electricity for welders, in lieu of diesel welders is encouraged and required as part of mitigation for air quality construction emissions.) Any additional electricity that may be needed as part of implementing the proposed project is typically supplied by each affected facility's local electrical utility and if applicable, supplemented by the facility's own cogeneration unit.

Table 4.3-2
Construction Fuel Use By Refinery Facility

Refinery ID	Affected Equipment/ Source Category and Potential NOx Control Equipment	Daily Fuel Usage (gal/day)		Project Fuel Usage (gal/project)	
		Diesel	Gasoline	Diesel	Gasoline
1	SRU/TGU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 14 SCRs total (but only 5 overlap)	2,356	697	316,573	145,165
2	Coke Calciner: 1 LoTOx™ with WGS or 1 Ultracat DGS	478	339	72,373	98,508
3	Boilers/Heaters: 2 SCRs	751	144	97,680	18,663
4	FCCU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 2 SCRs	1,229	482	170,053	117,171
5	FCCU: 1 SCR SRU/TGU: 2 LoTOx™ with WGSs SRU/TGU: 1 SCR Gas Turbine: 3 SCRs Boilers/Heaters: 4 SCRs	3,559	1,368	678,207	328,970
6	FCCU: 1 SCR SRU/TGU: 1 LoTOx™ with WGSs Gas Turbine: 1 SCR Boilers/Heaters: 5 SCRs	3,145	1,069	521,810	241,733
7	FCCU: 1 LoTOx™ without WGS Gas Turbine: 1 SCR Boilers/Heaters: 3 SCRs	1,503	287	195,360	37,326
8	SRU/TGU: 1 LoTOx™ with WGS Boilers/Heaters: 3 SCRs	1,605	554	218,893	126,502
9	FCCU: 1 LoTOx™ with WGS Boilers/Heaters: 2 SCRs	1,229	482	170,053	117,171
	TOTAL	**15,855**	**5,422**	**2,441,003**	**1,231,208**

Table 4.3-3
Construction Fuel Use By Non-Refinery Facility

Non-Refinery ID	Affected Equipment/ Source Category and Potential NOx Control Equipment	Daily Fuel Usage (gal/day)		Project Fuel Usage (gal/project)	
		Diesel	**Gasoline**	**Diesel**	**Gasoline**
1	ICEs: 5 SCRs[a] Gas Turbines: 3 SCRs	126	28	23,654	6,963
2	ICEs: 6 SCRs Gas Turbines: 4 SCRs	126	28	23,654	6,963
3	ICEs: 5 SCRs	126	28	23,654	6,963
4	Gas Turbines: 1 SCR	126	28	23,654	6,963
5	Gas Turbines: 2 SCRs	126	28	23,654	6,963
6	Gas Turbines: 1 SCR	126	28	23,654	6,963
7	Gas Turbines: 2 SCRs	126	28	23,654	6,963
8	Glass Melting Furnace: 2 SCRs or 1 Ultracat DGSs	126	28	23,654	6,963
9	Sodium Silicate Furnace: 1 SCR or 1 Ultracat DGSs	126	28	23,654	6,963
10	Metal Heat Treating Furnace: 1 SCR	126	28	23,6654	6,963
11	Gas Turbines: 1 SCR (replacement of existing)	126	28	23,654	6,963
	TOTAL	**1,381**	**306**	**260,197**	**76,595**

Table 4.3-4
Total Projected Construction Fuel Use By All 20 Facilities

Sector	Total Projected Construction Fuel Use	
	Diesel	**Gasoline**
9 Refineries	15,855 gal/day 2,441,003 gal/project	5,422 gal/day 1,231,208 gal/project
11 Non-Refineries	1,381 gal/day 260,197 gal/project	306 gal/day 76,595 gal/project
TOTAL	**17,236 gal/day 2,701,200 gal/project**	**5,728 gal/day 1,307,803 gal/project**
Threshold Fuel Supply[a]	4,347,945 gal/day 1,587,000,000 gal/project	39,687,671 gal/day 14,486,000,000 gal/project
% of Fuel Supply	0.4% per day 0.2 % per project	0.01% per day 0.01% per project
Significant (Yes/No)[b]	**NO**	**NO**

[a] 2012 California Retail Sales by County; California Energy Commission
http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_diesel_sales_by_county.html
http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_gasoline_sales_by_county.html
[b] SCAQMD's Energy Threshold for both types of fuel used is 1% of Fuel Supply.

However, because it is unknown whether electricity would be available to operate construction equipment, any electricity consumption that may occur during construction as a substitute for operating some diesel fueled construction equipment cannot be quantified.

Nonetheless, the amount of electricity that may be needed for this purpose is expected to be minimal because most of the construction activities will be supplied with diesel-powered construction equipment and each affected facility should have enough electricity supplies to provide power to the limited number of electric construction equipment that may be utilized under these circumstances.

Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for electricity usage during construction, implementation of the proposed project is expected to have less than significant energy impacts during construction. Further, any temporary usage of electricity during construction would not be expected to result in the need for new or substantially altered power utility systems. In addition, any temporary usage of electricity that may occur would not be expected to create any significant effects on local or regional electricity supplies or on requirements for additional electricity. Lastly, any temporary usage of electricity that may occur would not be expected to create any significant effects on peak and base period demands for electricity.

4.3.3.2 Mitigation of Construction Energy Impacts

Less than significant adverse impacts associated with energy (e.g., diesel fuel, gasoline, and electricity) are expected from the proposed project during construction, so no mitigation measures during construction are required.

4.3.3.3 Remaining Construction Energy Impacts After Mitigation

The energy analysis concluded that potential energy impacts during construction would be less than significant, so no mitigation measures are required. Thus, energy impacts during construction remain less than significant.

4.3.3.4 Energy Impacts During Operation

After the add-on air pollution control devices are installed and operating, adverse energy impacts (e.g., increased demand in energy) may occur during operation due to the need for: 1) electricity to operate the air pollution control devices; and, 2) diesel fuel to operate heavy-duty and medium-duty vehicles for delivering supplies and hauling waste during operation.

Tables 4.3-5 and 4.3-6 summarize the electricity sources and local utility service providers for the 20 affected facilities belonging to the refinery and non-refinery sectors, respectively.

Table 4.3-5
Facility-Specific Sources of Energy for Refinery Sector

Refinery ID	Electricity Source
1	1. Existing onsite cogeneration plant 2. Southern California Edison
2	1. Existing onsite cogeneration plant 2. Southern California Edison
3	1. Existing onsite cogeneration plant 2. Southern California Edison
4	1. Existing onsite cogeneration plant 2. Los Angeles Department of Water and Power
5	1. Existing onsite cogeneration plant 2. Southern California Edison
6	Southern California Edison
7	1. Existing onsite cogeneration plant 2. Los Angeles Department of Water and Power
8	Southern California Edison
9	Los Angeles Department of Water and Power

Table 4.3-6
Facility-Specific Sources of Energy for Non-Refinery Sector

Non-Refinery ID	Electricity Source
1	Existing onsite cogeneration plant
2	Existing onsite cogeneration plant
3	1. Existing onsite cogeneration plant 2. Southern California Edison
4	1. Existing onsite cogeneration plant 2. Southern California Edison
5	1. Existing onsite cogeneration plant 2. Los Angeles Department of Water and Power
6	1. Existing onsite cogeneration plant 2. Southern California Edison
7	1. Existing onsite cogeneration plant 2. Southern California Edison
8	City of Vernon
9	Southern California Edison
10	Southern California Edison
11	1. Existing onsite cogeneration plant 2. Southern California Edison

Energy information as it relates to operational activities was derived as part of the air quality analysis in Subchapter 4.2 and the calculations are shown in Appendix E of this PEA. If the potential NOx controls are installed and operated, Tables 4.3-7 and 4.3-8 summarize the estimated impacts on operational electricity use on a per facility per sector basis, respectively.

Table 4.3-7
Potential Operational Energy Use Per Refinery Facility

Refinery ID	**Affected Equipment/ Source Category and Potential NOx Control Equipment**	**Potential Increased Electricity Demand** (kWh/day)	**Potential Increased Instantaneous Electricity Demand** (MW)
1	SRU/TGU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 5 SCRs	41,307	1.72
2	Coke Calciner: 1 LoTOx™ with WGS or 1 Ultracat DGS	17,711	0.74
3	Boilers/Heaters: 2 SCRs	1,628	0.07
4	FCCU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 2 SCRs	25,162	1.05
5	FCCU: 1 SCR SRU/TGU: 2 LoTOx™ with WGSs SRU/TGU: 1 SCR Gas Turbine: 3 SCRs Boilers/Heaters: 4 SCRs	24,733	1.03
6	FCCU: 1 SCR SRU/TGU: 1 LoTOx™ with WGSs Gas Turbine: 1 SCR Boilers/Heaters: 5 SCRs	21,878	0.91
7	FCCU: 1 LoTOx™ without WGS Gas Turbine: 1 SCR Boilers/Heaters: 3 SCRs	8,168	0.34
8	SRU/TGU: 1 LoTOx™ with WGS Boilers/Heaters: 3 SCRs	14,307	0.60
9	FCCU: 1 LoTOx™ with WGS Boilers/Heaters: 2 SCRs	20,445	0.85
	TOTAL	**168,170**	**7.01**

In addition, as part of operation for three WGSs at Refineries 2, 4 and 9, NaOH caustic soda solution is required and approximately 2.47 tons per day would be needed. NaOH is produced locally by several chemical processing companies and as such, is locally available for transport. Further, it is likely that the existing local caustic manufacturers can handle the proposed increase in caustic for the entire project. To accommodate the estimated increase in caustic demand, the chemical processing companies may need to increase production, which, in turn, will use more electricity. It takes approximately 2,500 kWh to produce one metric ton of NaOH. Thus, the approximate amount of additional electricity that may be needed to produce additional caustic to meet the needs for these three refineries is approximately 13,235 kWh/day, calculated as follows:

<u>Electricity Needed to Manufacture Caustic Soda Solution:</u>

$$\frac{5.84 \text{ tons NaOH}}{\text{Day}} \times \frac{2{,}000 \text{ lbs}}{\text{Ton}} \times \frac{1 \text{ metric ton}}{2{,}205 \text{ lbs}} \times \frac{2{,}500 \text{ kWh}}{1 \text{ metric ton of NaOH produced}} = \mathbf{13{,}235 \text{ kWh/day}}$$

The overall electricity needed during operation activities for the refinery sector as summarized in Tables 4.3-7 include the amount of electricity that may be needed to produce additional NaOH.

Table 4.3-8
Potential Operational Energy Use Per Non-Refinery Facility

Non-Refinery ID	**Affected Equipment/ Source Category and Potential NOx Control Equipment**	**Potential Increased Electricity Demand** (kWh/day)	**Potential Increased Instantaneous Electricity Demand** (MW)
1	ICEs: 5 SCRs Gas Turbines: 3 SCRs	14,368	0.60
2	ICEs: 6 SCRs Gas Turbines: 4 SCRs	3,088	0.13
3	ICEs: 5 SCRs	462	0.02
4	Gas Turbines: 1 SCR	608	0.03
5	Gas Turbines: 2 SCRs	1,217	0.05
6	Gas Turbines: 1 SCR	608	0.03
7	Gas Turbines: 2 SCRs	9,370	0.39
8	Glass Melting Furnace: 2 SCRs	2,916	0.12
9	Sodium Silicate Furnace: 1 Tri-Mer	1,248	0.05
10	Metal Heat Treating Furnace: 1 SCR	11,458	0.48
11	Gas Turbines: 1 SCR (replacement of existing)	0	0
	TOTAL	45,344	1.89

To determine whether a project would cause an increased demand for electricity beyond the current capacities of the electric utilities, the SCAQMD determines significance for increased energy by comparing the potential increases in electricity demand to one percent of supply. Table 4.3-9 summarizes the how much electricity will be needed to construct all NOx control equipment at all 20 facilities combined. To determine if the operational energy use is significant, the total for electricity was compared to the threshold electricity supply as shown in Table 4.3-9.

Table 4.3-9
Total Projected Operational Electricity Demand By All 20 Facilities

Sector	Total Projected Electricity Demand	
	Daily (kwh/day)	Instantaneous (MW)
9 Refineries	168,170	7.01
11 Non-Refineries	45,344	1.89
TOTAL	**213,514**	**8.90**
Threshold Fuel Supply[a]	320,000,000 kWh	13,333 MW
% of Supply	0.07%	0.07%
Significant (Yes/No)[b]	**NO**	**NO**

[a] 2013 Electricity Use in GWh (Aggregated, includes self generation and renewables), for Los Angeles, Orange, Riverside and San Bernardino Counties, California Energy Commission .
[b] SCAQMD's Energy Threshold for electricity is 1% of Supply.

As shown in Table 4.3-9, the increased use of electricity during operation would not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD’s energy threshold of one percent of supply for electricity usage, implementation of the proposed project is expected to have less than significant energy impacts during operation. Further, any usage of electricity during operation would not be expected to result in the need for new or substantially altered power utility systems. In addition, any operational increases in electricity usage that may occur would not be expected to create any significant effects on local or regional electricity supplies or on requirements for additional electricity. Lastly, any increased operational usage of electricity that may occur would not be expected to create any significant effects on peak and base period demands for electricity.

During operation of the projected add-on air pollution control devices, adverse energy impacts (e.g., increased demand in energy) may also occur during operation due to the need for diesel fuel to operate heavy-duty and medium-duty vehicles for delivering supplies and hauling waste. For example, for refinery facilities, heavy-duty truck trips would be needed to deliver chemicals such as ammonia, sodium hydroxide, oxygen, lime, soda ash, and fresh catalyst and to haul away solid waste that may be generated and spent catalyst. Similarly, for non-refinery facilities, medium-duty and heavy-duty truck trips would be needed to deliver chemicals such as ammonia, urea, hydrated lime, and fresh catalyst and to haul away solid waste and filter waste that may be generated and spent catalyst.

Tables 4.3-10 and 4.3-11 summarize the how much diesel fuel and gasoline will be needed for support activities (fuel needed for the vehicles for deliveries and waste hauling) associated with the operation of an assortment of NOx control technologies at the 20 facilities for the refinery and non-refinery sectors, respectively.

Table 4.3-10
Operational Diesel Fuel Use By Refinery Facility

Refinery ID	Affected Equipment/ Source Category and Potential NOx Control Equipment	Diesel Fuel Usage From Heavy-Duty Truck Trips	
		Daily (gal/day)	**Annual (gal/yr)**
1	SRU/TGU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 5 SCRs	215	2,761
2	Coke Calciner: 1 LoTOx™ with WGS or 1 Ultracat DGS	126	1,298
3	Boilers/Heaters: 2 SCRs	61	225
4	FCCU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 2 SCRs	215	1,503
5	FCCU: 1 SCR SRU/TGU: 2 LoTOx™ with WGSs SRU/TGU: 1 SCR Gas Turbine: 3 SCRs Boilers/Heaters: 4 SCRs	337	4,438
6	FCCU: 1 SCR SRU/TGU: 1 LoTOx™ with WGSs Gas Turbine: 1 SCR Boilers/Heaters: 5 SCRs	276	3,753
7	FCCU: 1 LoTOx™ without WGS Gas Turbine: 1 SCR Boilers/Heaters: 3 SCRs	133	1,733
8	SRU/TGU: 1 LoTOx™ with WGS Boilers/Heaters: 3 SCRs	153	2,086
9	FCCU: 1 LoTOx™ with WGS Boilers/Heaters: 2 SCRs	153	3,446
	TOTAL	**1,670**	**21,241**

Table 4.3-11
Operational Diesel Fuel Use By Non-Refinery Facility

Non-Refinery ID	Affected Equipment/ Source Category and Potential NOx Control Equipment	Diesel Fuel Usage From Heavy-Duty & Medium DutyTruck Trips	
		Daily (gal/day)	Annual (gal/yr)
1	ICEs: 5 SCRs Gas Turbines: 3 SCRs	55	1,099
2	ICEs: 6 SCRs Gas Turbines: 4 SCRs	55	1,099
3	ICEs: 5 SCRs	55	1,099
4	Gas Turbines: 1 SCR	55	1,099
5	Gas Turbines: 2 SCRs	55	1,099
6	Gas Turbines: 1 SCR	55	1,099
7	Gas Turbines: 2 SCRs	55	1,099
8	Glass Melting Furnace: 2 SCRs	55	1,099
9	Sodium Silicate Furnace: 1 Tri-Mer	55	1,099
10	Metal Heat Treating Furnace: 1 SCR	55	1,099
11	Gas Turbines: 1 SCR (replacement of existing)	55	1,099
	TOTAL	**610**	**12,090**

To determine whether a project would cause a substantial depletion of existing energy resource supplies for diesel fuel, the SCAQMD determines significance for increased diesel fuel use by comparing the potential increases in diesel fuel needed to one percent of supply. Table 4.3-12 summarizes the how much diesel fuel will be needed to operate all NOx control equipment at all 20 facilities combined. To determine if the operational energy use is significant, the total for diesel fuel use was compared to the threshold fuel supply as shown in Table 4.3-12.

Table 4.3-12
Total Projected Operational Diesel Fuel Use By All 20 Facilities

Sector	Total Projected Diesel Fuel Use	
	Daily (gal/day)	Annual (gal/yr)
9 Refineries	1,670	21,241
11 Non-Refineries	610	12,090
TOTAL	**2,280**	**33,331**
Threshold Fuel Supply[a]	4,347,945	1,587,000,000
% of Fuel Supply	0.05%	0.002%
Significant (Yes/No)[b]	**NO**	**NO**

[a] 2012 California Retail Sales by County; California Energy Commission http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_diesel_sales_by_county.html
[b] SCAQMD's Energy Threshold for both types of fuel used is 1% of Fuel Supply.

As shown in Table 4.3-12, the increased use of diesel fuel during operation would not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for diesel fuel usage, implementation of the proposed project is expected to have less than significant energy impacts during operation. As such, the projected increased usage of diesel fuel would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, the projected increased usage of diesel fuel would not create any significant effects on peak and base period demands on the availability of diesel fuel.

4.3.3.5 Mitigation of Operational Energy Impacts

Less than significant adverse impacts associated with energy (e.g., increased usage in electricity, diesel fuel, and gasoline) are expected from the proposed project during operation, so no mitigation measures are required.

4.3.3.6 Remaining Operational Energy Impacts After Mitigation

The energy analysis concluded that potential energy impacts during operation would be less than significant, no mitigation measures were required. Thus, energy impacts during operation remain less than significant.

4.3.4 Cumulative Energy Impacts

Because the project-specific energy impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative energy impacts.

4.3.5 Cumulative Mitigation Measures

Because the project-specific energy impacts during construction and operation are not considered to be cumulatively considerable, no cumulative mitigation measures are required.

SUBCHAPTER 4.4

HAZARDS AND HAZARDOUS MATERIALS

4.4 HAZARDS AND HAZARDOUS MATERIALS

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in hazards and hazardous materials impacts. The hazards and hazardous materials impact analysis in this PEA identifies the net effect on hazards and hazardous materials from implementing the proposed project.

The potential for hazards exist in the production, use, storage, and transportation of hazardous materials. For the purposes of this PEA, the term "hazardous materials" refers to both hazardous materials and hazardous wastes. In general, hazards can occur due to natural events, such as earthquake, and non-natural events, such as mechanical failure or human error. The risk associated with each affected facility is defined by the probability of an event and the consequence (or hazards) should the event occur.

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. 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 potential for fires, explosions or the release of hazardous materials/substances in the event of an accident or upset conditions.

4.4.1 Introduction

The NOP/IS (see Appendix F) determined that the proposed project has the potential to generate significant adverse hazards and hazardous materials impacts. The hazard and hazardous materials impacts associated with the operation of the proposed project are potentially significant and the impacts are evaluated in this subchapter.

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of new or the modification of existing NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx at the affected facilities, which will provide air quality and human health benefits to the public. However, installing new or modifying existing air pollution control equipment is expected to have potentially adverse hazards and hazardous materials impacts.

4.4.2 Significance Criteria

Impacts associated with hazards will be considered significant if any of the following occur:

- 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.

4.4.3 Potential Hazards and Hazardous Materials Impacts and Mitigation Measures

Table 4.4-1 summarizes the estimated number of NOx emission control devices per sector and per equipment/source category. The different types of control devices include Selective Catalytic Reduction (SCR), a proprietary Low Temperature Oxidation technology (LoTOx^{TM}) with or without a Wet Gas Scrubber (WGS), and catalyst impregnated filters with a Dry Gas Scrubber (UltraCat DGS). In total, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx^{TM} with WGSs, one LoTOx^{TM} without WGS, and three UltraCat DGSs.

Table 4.4-1

Estimated Number of NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Number of Affected Facilities	Estimated Number of Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	5	2 SCRs 2 LoTOx^{TM} with WGSs 1 LoTOx^{TM} without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	5	5 LoTOx^{TM} with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx^{TM} with WGS or 1 UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	1	2 SCRs or 1 UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	1	1 SCR or 1 UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	1	1 SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	3	16 SCRs
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	7	13 SCRs and 1 SCR replacement
		TOTAL	**114 to 117 SCRs** **7 to 8 LoTOx^{TM} with WGSs** **1 LoTOx^{TM} without WGS** **3 UltraCat DGSs**

Several components with regard to reducing NOx emissions by installing new or modifying existing NOx controls as part of implementing the proposed project may affect the use, storage and transport of hazards and hazardous materials during operational-related activities. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing the proposed project.

The key effects of implementing the proposed project and the determination of which aspects involve hazards and hazardous materials focus on: 1) the anticipated increase of substances used to operate the new or modified NOx controls; and, 2) the increased capture of hazardous substances as part of the overall NOx reduction effort. Table 4.4-2 contains a summary of the substances that may be used, stored and transported as part of implementing the proposed project.

Table 4.4-2
Substances Used by NOx Control Technologies

Sector	Equipment/Source Category	Potential NOx Control Devices	Proposed Substances To Be Used/Increased for NOx Control
Refinery	FCCUs	1. SCRs 2. LoTOx™ with WGSs 3. LoTOx™ without WGS	1. NH3 and fresh catalyst 2. NaOH and fresh catalyst 3. Oxygen
Refinery	Refinery Process Heaters and Boilers	SCRs	NH3 and fresh catalyst
Refinery	Refinery Gas Turbines	SCRs	NH3 and fresh catalyst
Refinery	SRU/TGUs	1. LoTOx™ with WGSs 2. SCRs	1. Soda Ash 2. NH3 and fresh catalyst
Refinery	Petroleum Coke Calciner	1. LoTOx™ with WGS 2. UltraCat DGS	1. NaOH and fresh catalyst 2. NH3 and Hydrated Lime – Ca(OH)2
Non-Refinery	Container Glass Melting Furnaces	1. SCR 2. UltraCat DGS	1. NH3 and fresh catalyst 2. Hydrated Lime – Ca(OH)2 and fresh catalyst
Non-Refinery	Sodium Silicate Furnaces	1. SCR 2. UltraCat DGS	1. NH3 and fresh catalyst 2. NH3 and fresh catalyst
Non-Refinery	Metal Heat Treating Furnaces	SCRs	NH3 and fresh catalyst
Non-Refinery	ICEs (Non-Refinery/Non-Power Plant)	SCRs	NH3 and fresh catalyst
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	SCRs	NH3 and fresh catalyst

Hazard Safety Regulations

Notwithstanding implementation of the proposed project, operators of each affected facility must comply or continue to comply with various regulations, including Occupational Safety and Health Administration (OSHA) regulations (29 Code of Federal Regulations (CFR) Part 1910) that require the preparation of a fire prevention plan, and 20 CFR Part 1910 and CCR Title 8 that require prevention programs to protect workers who handle toxic, flammable, reactive, or explosive materials. In addition, §112 (r) of the CAA Amendments of 1990 [42 United States Code (USC) 7401 et. seq.] and Article 2, Chapter 6.95 of the California HSC require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances. If any of the affected facilities has already prepared an RMP, it may need to be revised to incorporate any changes that may be associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

A number of physical or chemical properties may cause a substance to be hazardous. With respect to determining whether any material identified in Table 4.4-5 is hazardous, each Material Safety Data Sheet (MSDS) has also been consulted for the National Fire Protection Association (NFPA) 704 hazard rating system (i.e. 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 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 4.4-3 summarizes what the codes mean for each hazards category.

It is expected that the operators of affected facilities will comply with all applicable design codes and regulations, conform to NFPA standards, and conform to policies and procedures concerning leak detection containment and fire protection. Therefore, no significant adverse offsite hazard impacts are expected as explained in the following sections.

[1] National Fire Protection Association, FAQ for Standard 704.
http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1#23057

Table 4.4-3
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	
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.	

<u>Hazard Impacts on Water Quality</u>

A spill of any hazardous material that is 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 Uniform Building Code Zone 4 requirements helps structures to resist major earthquakes without collapse, but may result in some structural and non-structural damage following a major earthquake. Any facility with storage tanks on-site is 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 the affected facilities would generally be collected within containment areas. Large spills outside of containment areas at the affected facilities 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. Because of the containment system design, spills are not expected to migrate from the spill site and as such, potential adverse water quality hazard impacts are considered to be less than significant.

Project Specific Impacts

The following discussion describes the hazards profile for each substance involved with proposed NOx control equipment.

Caustic

For any operator that chooses to install a WGS for a FCCU, hazardous materials may be needed to operate the WGSs depending on the source category and additional solid waste is expected to be generated. Caustic is a key ingredient needed for the operation of a WGS. While there are several types of caustic solutions that can be used in WGS operations, caustic made from sodium hydroxide (NaOH) is the most commonly used for WGSs for FCCUs and it is considered an acutely hazardous substance. Located on the MSDS for NaOH (50 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous), flammability is rated 0 (none) and reactivity is rated 1 (slightly hazardous).

For WGSs that may be installed to control NOx from SRU/TGUs, the caustic used in the WGS is made from soda ash, instead of NaOH. Soda ash is the common name for sodium carbonate (Na2CO3), a non-toxic, non-cancerous, and non-hazardous substance. Located on the MSDS for Na2CO3, the hazards ratings are as follows: health is rated 2 (moderate), flammability is rated 0 (none) and reactivity is rated 0 (none). Soda ash has a NFPA health rating 2 because it corrosive and may be harmful if inhaled and may cause skin irritation and workers handling soda ash will need to take the necessary precautions when dealing with this substance. Thus, less than significant increases in hazards associated with the use, storage, or transportation relative to the deliveries of soda ash is expected.

As previously analyzed in Subchapter 4.2 in the air quality discussion, for "worst-case" operations, 5.84 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate three WGSs at three refineries. In addition, even though the refineries may already use NaOH elsewhere in their facilities, for the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed.

As previously summarized in Table 4.2-22 in Subchapter 4.2, for each refinery that was projected to increase the use in the acutely hazardous substance NaOH, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities. Because the screening level for NaOH was not exceeded for any of the affected facilities, no significant hazards and hazardous materials impacts with respect to NaOH uses are expected from the proposed project. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed.

It is expected that the affected facilities will receive NaOH from a local supplier located in the greater Los Angeles area. Deliveries of NaOH (50 percent by weight) would be made by tanker truck via public roads. The maximum capacity of a NaOH tanker truck is approximately 6,000 gallons.

The projected consumption and the annual deliveries of NaOH are summarized in Tables 4.4-4. To accommodate the increased demand in NaOH, there will be an increase in truck deliveries to supply NaOH to the facilities that need it. Table 4.4-4 also summarizes the annual and peak daily truck deliveries needed to supply NaOH. Based on the volume of NaOH solution (50 percent by weight) needed, the calculations assume that one 10,000 gallon capacity storage tank will be installed at each affected facility for NaOH storage. The amount of annual deliveries is based on the assumption that one delivery truck can hold 6,000 gallons per truck load. While the number of annual NaOH deliveries will vary based on each facility's needs, the peak daily truck deliveries would be one truck per day per facility. Based on the annual deliveries estimates, each facility is not expected to exceed the peak of one delivery per day per facility. However, the "worst-case" assumption for a peak daily delivery frequency from a supplier would be to deliver 10,000 gallons of NaOH to two facilities to fill two new NaOH tanks on the same day. Regulations for the transport of hazardous materials by public highway are described in 49 CFR §§ 173 and 177.

Table 4.4-4

Summary of NaOH Deliveries

Refinery ID	Daily Increase in NaOH Demand (tons/day)	Annual Increase in NaOH Demand (tons/year)	Peak Daily NaOH Deliveries (truck trips/day)	Annual NaOH Deliveries [1] (truck trips/year)
2	3.37	1,228	1	32
4	0.45	164	1	5
9	2.02	737	1	19
Total	**5.84**	**2,129**	**3**	**56**

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, for Refinery 4: 164 tons/yr NaOH x 2,000 lbs/ ton = 328,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 25,685 gal/year x 1 truck/6,000 gallons = 4.28 trucks/year (rounded up to 5 to be conservative).

Both the refineries currently receive NaOH from local suppliers located in the greater Los Angeles area. As is currently the case with existing NaOH deliveries, deliveries of additional NaOH would be made to each facility by tanker truck via public roads. NaOH is typically delivered in 6,000 gallon trucks, so the proposed project would not introduce any new transportation hazards for NaOH.

The onsite storage and handling of NaOH creates the possibility of an accidental spill and release of NaOH. However, because NaOH has such a low vapor pressure (6.33 mm Hg at 40 ^{o}C or 104 ^{o}F) when compared to water (55.3 mm Hg at 40 ^{o}C or 104 ^{o}F) at the same temperature, any spill of NaOH would not be expected to evaporate faster than water. Thus, any spill of NaOH would be expected to stay in liquid form and would not likely exceed the ERPG-2 vapor concentration of five milligrams per cubic meter for NaOH. Further, operators at each affected facility who construct a new NaOH storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release due to tank rupture. Thus, any spill of NaOH would not be expected to migrate beyond the boundaries of the berm on-site. Thus, any spill of NaOH is not expected to present a potential offsite public and sensitive receptor exposure. Lastly, since NaOH is not a flammable compound, other types of heat-related hazard impacts such as fires, explosions, boiling liquid – expanding vapor explosion (BLEVE) are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis.

In conclusion, the hazards and hazardous materials impacts due to the use, tank rupture and the accidental release of NaOH will be less than significant for the proposed project.

Hydrated Lime

For any operation that chooses to install an Ultracat DGSs, a dry calcium- and sodium-based alkaline powdered sorbent can be used to absorb NOx from the flue (outlet) gas stream. The sorbent expected to be used in the Ultracat DGSs for the coke calciner and the container glass melting furnaces will be hydrated lime, also known as calcium hydroxide (Ca(OH)2). Approximately 2.7 tons per day of hydrated lime may be needed as part of operating two UltraCat DGSs at two facilities (one refinery and one non-refinery facilities). Note that the third UltraCat DGS is assumed to only use ammonia because an evaluation of the sodium silicate furnaces exhaust shows that the use of hydrated lime would not be effective for reducing NOx emissions.

Calcium carbonate is a non-toxic, non-cancerous, and non-hazardous substance. The NFPA has not assigned a rating for calcium carbonate. The solid waste by-products that may be generated from this process would also not be considered hazardous waste. Because calcium carbonate is not considered to be hazardous, no increase in transportation hazards relative to the deliveries of calcium carbonate or the hauling of calcium carbonate waste is expected. In conclusion, the hazards and hazardous materials impacts due to the use of hydrated lime and the recycling or disposal of its solid, non-hazardous waste by-product is expected to be less than significant for the proposed project.

Ammonia

Ammonia (NH3,) though not a carcinogen, is a chronic and acutely hazardous material. Located on the MSDS for NH3 (19 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous), flammability is rated 1 (slight) and reactivity is rated 0 (none). Therefore, an increase in the use of ammonia in response to the proposed project may increase the current existing risk setting associated with deliveries (i.e., truck and road accidents) and onsite or offsite spills for each of the facilities that currently use 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 and migrate 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 project and that are currently permitted to use anhydrous ammonia, for new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia. To minimize the hazards associated with using ammonia for air pollution control technology, it is the permitting policy of the SCAQMD to require the use of 19 percent by volume aqueous ammonia in air pollution control 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. As such, SCAQMD staff does not issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by volume for use in SCR systems. As a result, this analysis focuses on the use of 19 percent by volume aqueous ammonia. Thus, because aqueous ammonia (at 19 percent by weight) would be required for any permits issued for the installation of air pollution control equipment that utilize ammonia, no new hazards from toxic clouds are expected to be associated with the proposed project.

In addition, the shipping, handling, storage, and disposal of hazardous materials inherently poses a certain risk of a release to the environment. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing the proposed project. Further, if the control option chosen by each affected facility is to install control technology that utilizes ammonia, such as SCR or a DGS, the proposed project may alter the transportation modes for feedstock and products to/from the existing facilities such as aqueous ammonia and catalyst.

The analysis of hazard impacts can rely on information from past similar projects (i.e., installing new, or retrofitting existing equipment with NOx control technology that utilizes ammonia to comply with SCAQMD rules and regulations and installation of associated ammonia storage tanks) where the SCAQMD was the lead agency responsible for preparing an environmental analysis pursuant to CEQA. To the extent that future projects to install NOx control technology that utilizes ammonia and associated ammonia storage equipment conform to the ammonia hazard analysis in this PEA, no further hazard analysis may be necessary. If site-specific characteristics are involved with future projects to install NOx control equipment that utilize ammonia that are outside the scope of this analysis, a further ammonia hazards analysis may be warranted.

The maximum capacity of an ammonia tanker truck is approximately 7,000 gallons. Based on, the "worst-case" assumption for delivery frequency from a supplier would be to deliver

If all 117 SCRs are installed at all 20 facilities and one Ultracat DGS is installed at one facility, approximately 39.5 tons per day (equivalent to approximately 10,284 gallons per day) of aqueous ammonia (at 19 percent concentration) would be needed to operate the equipment. It is expected that the affected facilities will receive ammonia from a local ammonia supplier located in the greater Los Angeles area. Deliveries of aqueous ammonia would be made by tanker truck via public roads. Since one ammonia delivery truck can deliver up to 7,000 gallons per visit, based on the peak daily total volume of ammonia that would be needed, two trucks would be needed on a peak day. However, because the deliveries are spread across 20 facilities, the analysis conservatively assumes that 28 tankers carrying up to 7,000 gallons per truck would visit all 20 facilities on a peak day. Because the size of the aqueous ammonia storage tanks varies from 600 gallons to 11,000 gallons and the amount needed on a daily basis per facility will also vary, the actual amount of aqueous ammonia delivered per facility on a peak day will vary. The onsite storage capacity and the projections for future ammonia use and storage are estimated in Appendix E.

The accidental release of ammonia from a delivery and use is a localized event (i.e., the release of ammonia would only affect the receptors that are within the zone of the toxic endpoint). The accidental release from a delivery would also be temporally limited in the fact that deliveries are not likely to be made at the same time in the same area. Based on these limitations, it is assumed that an accidental release would be limited to a single delivery or single facility at a time. In addition, it is unlikely that an accidental release from both a delivery truck and the stationary storage tank would result in more than the amount evaluated in the catastrophic release of the storage tank because the level of ammonia in the storage tanks would be low or else the delivery trip would not be necessary.

Ammonia Transportation Release Scenario:
To analyze the effects of aqueous ammonia as a result of an accidental release due to tank rupture, a Consequence Analysis using the EPA RMP*Comp (Version 1.07) is typically performed. Aqueous ammonia trucks have a capacity of 7,000 gallons. EPA's RMP*Comp was used to estimate the zone of impact from a worst-case release. Although it is SCAQMD policy to reduce potential hazards associated with ammonia by requiring a permit condition that limits the aqueous ammonia concentration to 19 percent, the EPA model only has the capability of evaluating the hazard potential of 20 percent aqueous ammonia. Therefore, the potential adverse impacts from aqueous ammonia were evaluated based on 20 percent aqueous ammonia. Based on the worst-case defaults, the toxic endpoint from a delivery truck would be 0.4 miles.

A hazard analysis is dependent on knowing the exact location of the spill (e.g., meteorological conditions, location of the receptor, et cetera, a site-specific hazard analysis is difficult to conduct without this information. Since SCAQMD staff does not currently know the exact location of ammonia storage tanks that would be installed in the future, to estimate a worst-case analysis, the RMP*COMP worst-case assumptions were used:

Location of tank~~s~~: Stand alone tanks (i.e., not within a building)

Quantity Released: 7,000 gallons of aqueous ammonia

Liquid Temperature at the time of the spill: 77 degrees Fahrenheit

Mitigation Measures: None

Topography: Urban surroundings with many obstacles in the immediate area

Toxic Endpoint: 0.14 milligrams per liter (basis: ERPG-2)

Wind Speed: 1.5 meters per second (3.4 miles per hour)

Air Temperature: 77 degrees Fahrenheit

The estimated distance to the toxic endpoint from a worst-case delivery truck release is 0.4 miles or 2,112 feet. Since sensitive receptors are expected to be found within 0.4 miles from roadways, the hazards and hazardous materials impacts due to-a delivery truck accident will be potentially significant. Therefore, the proposed project has the potential to generate significant adverse hazard impacts during transportation as a result of the potential for accidental releases of delivered aqueous ammonia.

Ammonia Tank Rupture Scenario 1 (Non-Refinery Sector):
Based on engineering estimates and discussion with control technology vendors, it was estimated that the largest aqueous ammonia tank that would be installed at a non-refinery facility would be 5,000 gallons. All ammonia tanks are required to be installed within berms that hold 110 percent of the contents of the tank. EPA's RMP*Comp was used to estimate the zone of impact from a worst-case release. Although it is SCAQMD policy to reduce potential hazards associated with ammonia by requiring a permit condition that limits the aqueous ammonia concentration to 19 percent, the EPA model only has the capability of evaluating the hazard potential of 20 percent aqueous ammonia. Therefore, the potential adverse impacts from aqueous ammonia were evaluated based on the 20 percent aqueous ammonia. Further, since it is assumed that an aqueous ammonia tank servicing one or more SCR systems would need to be relatively near to the existing equipment, the toxic endpoint for aqueous ammonia from a worst-case failure of a storage tank would significantly adversely affect the sensitive receptors within 0.1 mile of the existing equipment.

A hazard analysis is dependent on knowing the exact location of the hazard within the site (e.g., location of the ammonia storage tank(s)), meteorological conditions, location of the receptor, et cetera, a site-specific hazard analysis is difficult to conduct without this information. Since SCAQMD staff does not currently know the exact location of ammonia storage tanks that would be installed in the future, to estimate a worst-case analysis, the RMP*COMP worst-case assumptions were used:

Location of tanks: Stand alone tanks not within a building

Quantity Released: 5,500 gallons of aqueous ammonia will be spilled into a berm (the total of one 5,000 gallon tanks plus 10 percent to account for a rupture during filling)

Liquid Temperature at the time of the spill: 77 degrees Fahrenheit

Mitigation Measures: Release into an open berm, in direct contact with outside air

Topography: Urban surroundings with many obstacles in the immediate area

Toxic Endpoint: 0.14 milligrams per liter (basis: ERPG-2)

Wind Speed: 1.5 meters per second (3.4 miles per hour)

Air Temperature: 77 degrees Fahrenheit

The estimated distance to the toxic endpoint from the facility is 0.1 miles or 528 feet. There are no schools or other sensitive receptors located within 0.1 miles of any of the non-refinery facilities. Thus, the hazards and hazardous materials impacts due to tank rupture for non-refinery facilities will be less than significant. Therefore, the proposed project does not have the potential to generate significant adverse hazard impacts as a result of the potential for accidental releases of aqueous ammonia.

Ammonia Tank Rupture Scenario 2 (Refinery Sector):
Based on engineering estimates and discussion with control technology vendors, it was estimated that the largest aqueous ammonia tank that would be installed at a refinery facility would be 11,000 gallons. Although it is SCAQMD policy to reduce potential hazards associated with ammonia by requiring a permit condition that limits the aqueous ammonia concentration to 19 percent, the EPA model only has the capability of evaluating the hazard potential of 20 percent aqueous ammonia. Therefore, the potential adverse impacts from aqueous ammonia were evaluated based on the 20 percent aqueous ammonia. Further, since it is assumed that an aqueous ammonia tank servicing one or more SCR systems would need to be relatively near to the existing equipment, the toxic endpoint for aqueous ammonia from a worst-case failure of a storage tank would significantly adversely affect the sensitive receptors within 0.1 mile of the existing equipment.

A hazard analysis is dependent on knowing the exact location of the hazard within the site (e.g., location of the ammonia storage tank(s)), meteorological conditions, location of the receptor, et cetera, a site-specific hazard analysis is difficult to conduct without this information. Since SCAQMD staff does not currently know the exact location of ammonia storage tanks that would be installed in the future, to estimate a worst-case analysis, the RMP*COMP worst-case assumptions were used:

Location of tanks: Stand alone tanks not within a building

Quantity Released: 12,100 gallons of aqueous ammonia will be spilled into a berm (the total of one 11,000 gallon tanks plus 10 percent to account for a rupture during filling)

Release Rate: 11.7 pounds per minute

Liquid Temperature at the time of the spill: 77 degrees Fahrenheit

Mitigation Measures: Release into an open berm, in direct contact with outside air

Topography: Urban surroundings with many obstacles in the immediate area

Toxic Endpoint: 0.14 milligrams per liter (basis: ERPG-2)

Wind Speed: 1.5 meters per second (3.4 miles per hour)

Air Temperature: 77 degrees Fahrenheit

The estimated distance to the toxic endpoint from any refinery facility is 0.1 miles or 528 feet. Since there are no sensitive receptors within 0.1 miles from any refinery facility, the hazards and hazardous materials impacts due to tank rupture will not be potentially significant. Therefore, for the affected refinery facilities, the proposed project does not have the potential to generate significant adverse hazard impacts as a result of the potential for accidental releases of aqueous ammonia for refinery facilities.

<u>Oxygen</u>

One facility (Refinery 7) is assumed to need an ozone generator which requires a regular supply of oxygen to operate a LoTOx^{TM} unit that may be installed to work with an existing WGS that services the FCCU. Approximately 7,950 pounds of oxygen will be needed on peak day. The analysis assumes that one oxygen delivery truck on a peak day and 44 oxygen delivery trucks in one year will be needed.

Oxygen is an odorless, colorless, nonflammable gas that is stored in tanks or cylinders at high pressure. Oxygen is a non-toxic, non-cancerous, and non-hazardous substance. While no NFPA ratings have been assigned for health, flammability, or reactivity, the NFPA has assigned a special rating to oxygen, OXY, because it is considered an oxidizer that vigorously accelerates combustion. For example, some materials which are noncombustible in air will burn in the presence of an oxygen enriched atmosphere (greater than 23%). In addition, fire resistant clothing may burn and offer no protection in oxygen rich atmospheres. Oxygen may form explosive compounds when exposed to combustible materials or oil, grease, and other hydrocarbon materials. Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function. Upon exposure to intense heat or flame cylinder will vent rapidly and/or rupture violently. Most storage tanks and cylinders are designed to vent contents when exposed to elevated temperatures. Thus, because oxygen is not considered to be hazardous, no increase in hazards associated with the use, storage, or transportation relative to the deliveries of oxygen is expected.

<u>Solid Waste</u>

If the proposed project is implemented, additional solid waste may be generated, depending on the type of NOx control equipment employed. Tables 4.4-5 and 4.4-6 summarize the potential increased amount of solid waste expected to be generated for the refinery and non-refinery sector.

Table 4.4-5

Potential Increase in Solid Waste at Refinery Facilities

Refinery ID	**Proposed Increase in Amount of Solids Collected Due to New NOx Controls** (tons/day)	**Is the proposed increase in Solid Waste Hazardous?**	**Solid Waste will be trucked to:**
1	0.68	NO	Cement Plant for Recycling
2	0.44	NO	Cement Plant for Recycling
3	0	NO	Not Applicable
4	0.44	NO	Cement Plant for Recycling
5	1.75	NO	Cement Plant for Recycling
6	0.88	NO	Cement Plant for Recycling
7	0	NO	Not Applicable
8	0.33	NO	Cement Plant for Recycling
9	1.89	NO	Cement Plant for Recycling
Total	**6.41**		

Table 4.4-6
Potential Increase in Solid Waste at Non-Refinery Facilities

Non-Refinery ID	**Proposed Increase in Amount of Solids Collected Due to New NOx Controls** (tons/day)	**Is the proposed increase in Solid Waste Hazardous?**	**Solid Waste will be trucked to:**
1	0	NO	Not Applicable
2	0	NO	Not Applicable
3	0	NO	Not Applicable
4	0	NO	Not Applicable
5	0	NO	Not Applicable
6	0	NO	Not Applicable
7	0	NO	Not Applicable
8*	1.2	NO	Cement Plant for Recycling or Class III Landfill
9	0	NO	Not Applicable
10	0	NO	Not Applicable
11	0	NO	Not Applicable
Total	**1.2**		

* Solid waste would only be generated if the operator of non-refinery Facility 8 chooses to install an Ultracat system. However, if the operator of non-refinery Facility 8 chooses to install SCR technology, in lieu of the Ultracat system, then no solid waste would be generated.

Thus, because the solid waste that may be generated from the proposed project is not considered to be hazardous, less than significant hazards and hazardous waste impacts associated with the use, storage, or transportation relative to the hauling of solid waste are expected.

<u>Fresh and Spent Catalyst</u>
Commercial catalysts used in SCRs 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). SCR catalysts are replaced approximately one every five years. The key hazards associated with the proposed project are the crushing of the spent catalyst and transporting it for disposal or recycling. Recycling of catalyst means hauling the spent catalyst to a cement plant located outside of the District for use in manufacturing cement.

With respect to hazards and hazardous materials, 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..

Although recycling may be the more popular (and potentially lucrative) consideration, it is possible that facilities may choose to dispose of the spent catalyst in a landfill. The composition and type of the catalyst will determine the type of landfill that would be eligible to handle the disposal. For example, catalysts with a metal structure would be considered a metal waste, like copper pipes, and not a hazardous waste. Therefore, metal structure catalysts would not be a regulated waste requiring disposal in a Class I landfill, unless it is friable or brittle. As ceramic-based catalysts contain a fiber-binding material, they are not considered friable or brittle and, thus, would not be a regulated waste requiring disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill. In both cases, spent catalyst would not require disposal in a Class I landfill.

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 Material Safety Data Sheet (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 still be recycled (e.g., to be reused by another industry such as manufacturing Portland cement). However, for any spent catalyst that is considered hazardous waste, if it is not recycled, then it must be disposed of in a landfill that can accept hazardous waste.

Based on the aforementioned information, it is likely that spent catalysts would be considered a "designated waste," which 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 (California Code of Regulations, Title 23, Chapter 3 Subparagraph 2522(a)(1)). Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. Based on the remaining permitted Class III landfill capacity data for each county as provided in Subchapter 3.6 – Solid and Hazardous Waste, Table 3.6-2, the total remaining permitted Class III landfill capacity in Los Angeles, Orange, Riverside, and San Bernardino counties is 107,933 tons per day.

<u>Proximity to Schools</u>

Of the facilities that may install NOx control equipment, none of the facilities in either the refinery sector or non-refinery sector are located within one-quarter mile of an existing or proposed school. Therefore, no potential for adversely significant impacts from hazardous emissions onsite or the handling of acutely hazardous materials, substances and wastes on sensitive receptors is expected from the proposed project.

<u>Summary</u>

Table 4.4-7 summarizes the substances that may be involved in the various processes at the affected facilities.

Table 4.4-7
Substances that May Be Affected By The Proposed Project

Substance	Potential Overall Increase, Decrease, or No Change from Existing Setting?	Contains TAC(s) per SCAQMD Rule 1401?	Hazardous per CalARP?	NFPA Rating: Health (Blue)	NFPA Rating: Flammability (Red)	NFPA Rating: Reactivity (Yellow)	NFPA Rating: Special (White)
Hydrated Lime - Ca(OH)2	Increase	No	No	N/A	N/A	N/A	N/A
NaOH Caustic (50% by weight)	Increase	Yes, Acute (non-cancer)	Yes	3	0	1	None
Soda Ash Caustic (sodium carbonate)	Increase	No	No	2	0	0	None
NH3 (19% by weight)	Increase	Yes, Chronic & Acute (non-cancer)	Yes	3	1	0	None
Oxygen	Increase	No	No	0	0	0	Oxy
Solid Waste	Increase	No	No	N/A	N/A	N/A	N/A
Fresh Catalyst	Increase	No	No	N/A	N/A	N/A	N/A
Spent Catalyst	Increase	No	No	N/A	N/A	N/A	N/A

NFPA Hazard Code Key: 4 = Extreme; 3 = High; 2 = Moderate; 1 = Slight; 0 = Insignificant; N/A = NFPA hazard is not assigned.

Some of the substances listed are considered hazardous while others are not. Of the substances listed in this table, the only net increase in the use of a hazardous material will be for NaOH and ammonia. The effects of the potential increased use of NaOH and ammonia have been previously analyzed in the "Caustic" and "Ammonia" discussions, respectively. For the remaining substances identified, there will be no change in hazards from the existing setting. Thus, none of the changes to the existing setting is expected to result in a significant adverse impact for hazards and hazardous materials.

Project-Specific Impacts – Conclusion

Based on the preceding description of hazards and hazardous materials impacts, the proposed project is expected to generate significant adverse hazards and hazardous materials impacts for ammonia deliveries and less than significant hazards and hazardous materials impacts for ammonia use and storage. For the substances other than ammonia listed in Table 4.4-8, the proposed project is expected to generate less than significant hazards and hazardous materials impacts. To the extent that future projects to install new or modify existing NOx controls conform with the hazard analysis in this PEA, no further hazard analysis may be necessary. However, if site-specific characteristics are involved with future projects that are outside the scope of this analysis, further hazards analysis may be warranted.

Project-Specific Mitigation: The analysis concluded that the hazards and hazardous materials impacts from implementing the proposed project are considered to be adverse for ammonia deliveries. Therefore, mitigation measures are required. However, no feasible mitigation measures have been identified, over and above the extensive safety regulations that currently apply to delivery trucks that haul ammonia.

The analysis also concluded that the hazards and hazardous materials impacts from implementing the proposed project are considered to be less than significant for ammonia use and storage. Finally, for the substances other than ammonia listed in Table 4.4-8, analysis concluded that the proposed project is expected to generate less than significant hazards and hazardous materials impacts. Therefore, mitigation measures are not required.

Remaining Impacts After Mitigation: The hazards and hazardous materials analysis concluded that potential hazards and hazardous materials impacts for ammonia deliveries would be significant such that mitigation measures are required. However, because there are no feasible mitigation measures, over and above the extensive safety regulations that currently apply to delivery trucks that haul ammonia, to reduce ammonia transportation impacts to less than significant, the hazards and hazardous materials impacts for the ammonia deliveries remain significant.

For ammonia use and storage and for the other substances listed in Table 4.4-8, the hazards and hazardous materials analysis concluded that potential hazards and hazardous materials impacts would be less than significant, such that no mitigation measures are required. Thus, the hazards and hazardous materials impacts for these substances remain less than significant.

4.4.4 Cumulative Hazards and Hazardous Materials Impacts

Because the project-specific hazards and hazardous materials impacts for ammonia deliveries would potentially create significant impacts, they are considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, generate significant adverse cumulative hazards and hazardous materials impacts.

For ammonia use and storage and for the other substances listed in Table 4.4-8, the project-specific hazards and hazardous materials impacts do not exceed any applicable significance thresholds; thus, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative hazards and hazardous materials impacts.

4.4.5 Cumulative Mitigation Measures

Because the project-specific hazards and hazardous materials impacts are considered to be cumulatively considerable for ammonia deliveries, cumulative mitigation measures for hazards and hazardous materials impacts for ammonia deliveries are required. However, since no feasible mitigation measures have been identified, over and above the extensive safety regulations that currently apply to delivery trucks that haul ammonia, no feasible cumulative mitigation measures for ammonia deliveries have been identified.

For ammonia use and storage and for the other substances listed in Table 4.4-8, because the project-specific hazards and hazardous materials impacts are not considered to be cumulatively considerable, no cumulative mitigation measures for hazards and hazardous materials impacts for ammonia use and storage and for the other substances listed in Table 4.4-8 are required.

SUBCHAPTER 4.5

HYDROLOGY AND WATER QUALITY

4.5 HYDROLOGY AND WATER QUALITY

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in adverse hydrology and water quality impacts. The hydrology and water quality analysis in this PEA identifies the net effect of hydrology and water quality from implementing the proposed project.

4.5.1 Introduction

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. The different types of control devices include SCR, LoTOx^{TM} with or without a WGS, and catalyst impregnated filters with an UltraCat DGS. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx at the affected facilities, which will provide air quality and human health benefits to the public. However, installing new or modifying existing air pollution control equipment is expected to have potentially adverse hydrology and water quality impacts. The analysis of these impacts can be found in Section 4.5.3. Refer to Appendix E for the calculations used to estimate adverse hydrology and water quality impacts during construction and operation.

4.5.2 Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

<u>Water Demand:</u>

- 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 demand for total water by more than five million gallons per day.

<u>Water Quality:</u>

- 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.

4.5.3 Potential Hydrology and Water Quality Impacts and Mitigation Measures

Table 4.5-1 summarizes the estimated number of NOx emission control devices per sector and per equipment/source category. The different types of control devices include Selective Catalytic Reduction (SCR), a proprietary Low Temperature Oxidation technology (LoTOx^{TM}) with or without a Wet Gas Scrubber (WGS), and catalyst impregnated filters with a Dry Gas Scrubber (UltraCat DGS).). In total, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx^{TM} with WGSs, one LoTOx^{TM} without WGS, and three UltraCat DGSs.

Table 4.5-1

Estimated Number of NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Number of Affected Facilities	Estimated Number of Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	5	2 SCRs 2 LoTOx^{TM} with WGSs 1 LoTOx^{TM} without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	5	5 LoTOx^{TM} with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx^{TM} with WGS or 1 UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	1	2 SCRs or 1 UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	1	1 SCR or 1 UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	1	1 SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	3	16 SCRs
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	7	13 SCRs and 1 SCR replacement
		TOTAL	**114 to 117 SCRs** **7 to 8 LoTOx^{TM} with WGSs** **1 LoTOx^{TM} without WGS** **3 UltraCat DGSs**

4.5.3.1 Hydrology and Water Quality Impacts During Construction

Implementation of the proposed project could potentially result in construction activities at 20 NOx RECLAIM facilities, which are complex, well-established and mostly paved, industrial facilities. The physical changes that are expected from implementing the proposed project focus on the installation of new or the modification of existing control equipment for the following stationary sources of NOx: 1) FCCUs; 2) refinery boilers and heaters; 3) refinery gas turbines; 4) SRU/TGUs; 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant ICEs; 8) container glass melting furnaces; 9) coke calcining; and, 10) metal heat treating furnaces. As previously summarized in Table 4.3-1, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx™ with WGSs, one LoTOx™ without WGS, and three UltraCat DGSs.

During installation or modification of add-on air pollution control devices, adverse hydrology and water quality impacts may occur during construction due to the need for water for dust suppression. Depending on the proposed location within each facility's boundaries for the siting of any new control equipment that may be installed as a result of implementing the proposed project, construction activities such as digging, earthmoving, grading, slab pouring, or paving could occur if the proposed site for the new equipment is not suitable in its present form (e.g., graded with a foundation slab). Tables 4.5-2 and 4.5-3 contain a summary of the estimates of plot space needed per facility for the refinery and non-refinery sectors, respectively. Table 4.5-4 contains a summary of the estimates of plot space needed for all 20 facilities.

Based on the consultant's surveys of the affected facilities, if all affected facilities conduct site preparation activities, the total amount of disturbed area for all of the 20 facilities combined is estimated to be 102,495 square feet (2.35 acres). For a worst-case analysis, all affected facilities are assumed to conduct overlapping site preparation activities, though as a practical matter, not much overlap of site preparation activities would be expected since there are several years from when the first and last NOx RTC shave occurs (e.g., between 2016 and 2022). Further, depending on the scale, site preparation typically can take anywhere from two days to one month. Therefore, it is unlikely that all affected facilities will do site preparation both in the same month of the same year. The largest parcel of land to be potentially disturbed at any one facility could occur at Refinery 5 and is approximately 24,943 square feet which represents almost 25 percent of the total area to be disturbed.

Instead of installing new equipment, there are a few facility operators that may choose to modify or replace their existing NOx control equipment. In these cases, site preparation activities are not expected because the existing foundation and the existing equipment are expected to be reused in their current location and current plot space. Therefore, no water for dust suppression purposes is expected to be needed for any construction upgrades to existing NOx control equipment.

Table 4.5-2
Potential Plot Space Needed For Proposed NOx Control Technologies
at Refinery Facilities

Refinery ID	Potential NOx Control per Equipment/Source Category	Plot Space Needed for Proposed Controls (square feet)
1	SRU/TGU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 14 SCRs 15 NH3 Storage Tanks	3,953 + 0 + 2,464 + 6,000 + **12,417**
2	Coke Calciner: 1 Ultracat DGS or 1 LoTOx™ with WGS	**1,200**
3	Boilers/Heaters: 2 SCRs 14 NH3 Storage Tanks	352 + 800 + **1,152**
4	FCCU: 1 LoTOx™ with WGS Gas Turbine: 1 SCR Boilers/Heaters: 6 SCRs 6 NH3 Storage Tanks	1,575 + 0 + 888 + 2,400 + **4,863**
5	FCCU: 1 SCR SRU/TGU: 2 LoTOx™ with 2 WGSs SRU/TGU: 1 SCR Gas Turbine: 3 SCRs Boilers/Heaters: 12 SCRs 15 NH3 Storage Tanks	2,475 + 11,860 + 2,475 + 0 + 4,608 6,000 + **27,418**
6	FCCU: 1 SCR SRU/TGU: 1 LoTOx™ with WGSs Gas Turbine: 1 SCR Boilers/Heaters: 15 SCRs 17 NH3 Storage Tanks	2,475 + 5,930 + 0 + 5,760 6,800 **20,965**
7	FCCU: 1 LoTOx™ without WGS Gas Turbine: 1 SCR Boilers/Heaters: 9 SCRs 10 NH3 Storage Tanks	384 + 0 + 3,456 + 4,000 + **7,840**
8	SRU/TGU: 1 LoTOx™ with WGS Boilers/Heaters: 9 SCRs 9 NH3 Storage Tanks	3,953 + 3,456 + 3,600 + **11,009**
9	FCCU: 1 LoTOx™ with WGS Boilers/Heaters: 7 SCRs 7NH3 Storage Tanks	1,575 + 2,688 + 2,800 **7,063**
	TOTAL	**93,927**

Table 4.5-3
Potential Plot Space Needed For Proposed NOx Control Technologies
at Non-Refinery Facilities

Non-Refinery ID	**Potential NOx Control per Equipment/Source Category**	**Plot Space Needed for Proposed Controls** (square feet)
1	ICEs: 5 SCRs Gas Turbines: 3 SCRs 2 NH3 Storage Tanks	880 + 528 + 800 **2,208**
2	ICEs: 6 SCRs Gas Turbines: 4 SCRs 2 NH3 Storage Tanks	1,056 + 704 + 800 **2,560**
3	ICEs: 5 SCRs 1 NH3 Storage Tank	880 + 400 **1,280**
4	Gas Turbine: 1 SCR 1 NH3 Storage Tank	176 + 400 **576**
5	Gas Turbines: 2 SCRs 1 NH3 Storage Tank	352 + 400 **752**
6	Gas Turbine: 1 SCR 1 NH3 Storage Tank	176 + 400 **576**
7	Gas Turbines: 2 SCRs 1 NH3 Storage Tank	352 + 400 **752**
8	Glass Melting Furnace: 2 SCRs 2 NH3 Storage Tanks	352 + 800 **1,152**
9	Sodium Silicate Furnace: 1 Tri-Mer 1 NH3 Storage Tank	640 + 400 **1,040**
10	Metal Heat Treating Furnace: 1 SCR 2 NH3 Storage Tanks	176 + 800 **976**
11	Gas Turbine: 1 SCR (replacement of existing) 1 NH3 Storage Tank (existing)	0 + 0 **0**
	TOTAL	**12,272**

Table 4.5-4
Total Plot Space Needed By All 20 Facilities

Sector	**Plot Space Needed for Proposed Controls** (square feet)	**Total Acreage**
9 Refineries	93,927	2.16
11 Non-Refineries	12,272	0.28
TOTAL	**106,199**	**2.44**

The amount of plot spaced needed per facility directly correlates to how much soil may be disturbed and how much water may be needed for dust suppression during construction. To comply with the dust suppression requirements in SCAQMD Rule 403 – Fugitive Dust, during site preparation activities, some water is expected to be used. For example, one water truck per affected facility may be needed for dust suppression activities during the initial site preparation/earth moving portion of the proposed project. One water truck can hold approximately 6,000 gallons for dust control and it can be refilled over the course of the day if more than 6,000 gallons is needed. To minimize fugitive dust, a minimum of watering two times per day is required. However, on windy days, it may be necessary to conduct a third water application.

At a peak watering rate of three applications per day, Table 4.5-5 shows that the peak amount of water that could be used for site preparation/dust suppression is 12,501 gallons per day if all 20 facilities were under construction and disturbing the soil at the same time. The calculations in Table 4.5-5 assume watering three times per day during construction, with 1/16 inch depth of water applied per visit, and 451 gallons of water applied per cubic foot of disturbed area.

Table 4.5-5
Total Amount of Water Needed By All 20 Facilities For Dust Suppression

Sector	**Water Needed for Dust Suppression** (gallons/day)
9 Refineries	10,674
11 Non-Refineries	1,377
TOTAL	**12,501**

The potential increase in water use for the facilities that may need to conduct watering for dust suppression activities is below the SCAQMD's significance thresholds of five million gallons per day of total water (e.g., potable, recycled, and groundwater) and 262,820 gallons per day of potable water. It is important to note that due to the need to quickly construct a proper foundation for the proposed control equipment, earth moving activities during site preparation are expected to be of a short duration lasting from two to three days to no longer than one month per facility. As such, the corresponding dust control activities are also not expected to last longer than one month per facility. Further, water used for dust suppression does not have to be of potable quality, but can be recycled water. Nonetheless, the amount of water that may be used on a daily basis for dust suppression activities during construction is less than significant.

Once constructed, but prior to operation, additional water is expected to be used to hydrostatically (pressure) test all storage tanks and pipelines to ensure each structure's integrity and wastewater may be created during the testing. Pressure testing or hydrotesting is typically a one-time event, unless a leak is found. Similar to dust suppression, water used for pressure testing does not have to be of potable quality, but can be recycled water. In addition, water used during hydrotesting can be sent somewhere else within a facility for future re-use. For example, in the Final Negative Declaration for the Phillips 66 Los

Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project[1], water used during hydrotesting of the crude storage tank was later sent to hydrotest another smaller tank being built as part of the project. Afterwards, the water from the hydrotesting was transferred to a fire water tank that supplies process water to the refinery so that no water was wasted as a result of hydrotesting.

Tables 4.5-6 and 4.5-7 contain a summary of the number of NH3 storage tanks that may be constructed at each facility, the number of tanks that may have overlapping construction activities per facility, and the amount of water that may be needed to hydrotest each tank for the refinery and non-refinery sectors, respectively. Table 4.5-8 contains a summary of the peak water demand for hydrotesting one tank per facility at all 20 facilities in one day as well as the total amount of water needed for hydrotesting the entire project.

Table 4.5-6

Total Amount of Water Needed for Hydrotesting Storage Tanks at Refinery Facilities

Refinery ID	No. of NH3 storage tanks needed	Size of NH3 storage tanks needed (gallons)	Number of Tanks Overlapping Construction per day *(assumes 1/3rd of total number of tanks)*	Gallons of Water Needed to Hydrotest during Overlap	Gallons of Water Needed to Hydrotest for Entire Project
1	15	11,000	5	55,000	165,000
2	1	11,000	1	11,000	11,000
3	2	11,000	1	11,000	22,000
4	6	11,000	2	22,000	66,000
5	17	11,000	6	66,000	187,000
6	17	11,000	6	66,000	187,000
7	10	11,000	3	33,000	110,000
8	9	11,000	3	33,000	99,000
9	7	11,000	2	22,000	77,000
TOTAL	**84**		**29**	**319,000**	**924,000**

1 SCAQMD, Final Negative Declaration for the Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, SCH No. 2013091029, December 2014, p. 2-57. http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2014/phillips-66-fnd.pdf?sfvrsn=2

Table 4.5-7
Total Amount of Water Needed for Hydrotesting Storage Tanks at Non-Refinery Facilities

Non-Refinery ID	No. of NH3 storage tanks needed	Size of NH3 storage tanks needed (gallons)	Number of Tanks Overlapping Construction per day	Gallons of Water Needed to Hydrotest during Overlap	Gallons of Water Needed to Hydrotest for Entire Project
1	2	3,000	2	6,000	6,000
2	2	1,500	2	3,000	3,000
3	1	1,000	1	1,000	1,000
4	1	2,000	1	2,000	2,000
5	1	2,000	1	2,000	2,000
6	1	2,000	1	2,000	2,000
7	1	2,000	1	2,000	2,000
8	2	1,062	2	2,124	2,124
9	1	600	1	600	600
10	2	2,000	2	4,000	4,000
11	1	10,000	1	10,000	10,000
TOTAL	**15**		**15**	**34,724**	**34,724**

Table 4.5-8
Total Amount of Water Needed By All 20 Facilities For Hydrotesting

Sector	**Peak Daily Water Needed for Hydrotesting** (gallons/day)	**Total Water Needed for Hydrotesting Entire Project** (gallons/project)
9 Refineries	319,000	924,000
11 Non-Refineries	34,724	34,724
TOTAL	**353,724**	**958,724**

As shown in Table 4.5-7, the potential increase in water use for all 20 facilities conducting hydrotesting activities in one day is greater than the SCAQMD's significance threshold of 262,820 gallons per day of potable water. Thus, the amount of potable water that may be used on a daily basis for hydrotesting activities post-construction but prior to operation is potentially significant. However, the potential increase in water use for all 20 facilities conducting hydrotesting activities for the entire project is below the SCAQMD's significance threshold of five million gallons per day of total water. Thus, the amount of total water that may be used for hydrotesting activities post-construction but prior to operation for the entire project is less than significant.

Construction Water Quality

Any wastewater generated from hydrotesting or pressure testing is expected to flow to each affected facility's wastewater treatment or collection system and recycled or discharged after treatment with process wastewater. Thus, wastewater generation from pressure testing activities is not expected to affect groundwater quality. Further, the volume of wastewater that will be generated from pressure testing is expected to be minimal and within the capacity of each facility's wastewater treatment and collection systems.

Further, because the total amount of disturbed area for all of the facilities combined is estimated to be 106,199 square feet (2.44 acres) with the peak amount of area to be disturbed at Refinery 5 at 27,418 square feet (0.63 acre), the proposed construction activities will disturb less than one acre at all 20 facilities. This means that a NPDES General Permit for Storm Water Discharges Associated with Construction Activity, also referred to as a Storm Water Construction Permit, would not be required for any of the affected facilities. Because the proposed project is expected to disturb substantially less than one acre per facility, on-site collection of storm water in each facility's storm water collection system is expected to be about the same as the amount currently collected.

Therefore, less than significant impacts are expected from wastewater generation or storm water during construction or during hydrotesting post-construction.

Construction Conclusion

Construction Dust Suppression: Less than significant adverse water demand and wastewater impacts are expected during construction of the proposed project.

Hydrotesting Post-Construction: Significant adverse water demand impacts from hydrotesting are expected. Less than significant impacts are expected from wastewater generation or storm water from hydrotesting.

4.5.3.2 Mitigation of Construction Hydrology and Water Quality Impacts

Construction Dust Suppression: Less than significant adverse impacts associated with hydrology (water demand) and water quality are expected from the proposed project during construction, so no mitigation measures during construction are required.

Hydrotesting Post-Construction – Water Demand: Significant adverse water demand impacts from hydrotesting are expected, so mitigation measures during hydrotesting are required. For any facility that installs a storage tank as part of the proposed project, SCAQMD staff requires that the facility operators utilize both current supplies and future supplies of recycled water in accordance with the California Water Code, and if available, pursuant to the HRRWP or other recycled water pipeline, if available, to conduct hydrotesting of the storage tank. Based on the preceding discussion, the following water demand mitigation measures during hydrotesting will apply to the proposed project:

HWQ-1 When a storage tank is installed to support operations of installed NOx control equipment and hydrotesting is required prior to its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for hydrotesting.

HWQ-2 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to submit a written declaration with the application for a Permit to Construct for the storage tank, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

Hydrotesting Post-Construction – Water Quality: Less than significant impacts are expected from wastewater generation or storm water from hydrotesting, so no water quality mitigation measures are required during hydrotesting.

4.5.3.3 Remaining Construction Hydrology and Water Quality Impacts After Mitigation

Construction Dust Suppression: The hydrology and water quality analysis concluded that potential hydrology (water demand) and water quality impacts during construction would be less than significant, so no mitigation measures are required during construction. Thus, hydrology and water quality impacts during construction remain less than significant.

Hydrotesting Post-Construction – Water Demand: The hydrology analysis concluded that potential water demand impacts during hydrotesting would be significant, so mitigation measures are required during hydrotesting. The water demand analysis during hydrotesting shows that the potential increase in potable water use cannot be fully supplied either with all potable water or with a combination of recycled water and potable water, since some potable water may still be required for certain facilities. The use of recycled water can help substantially reduce the water demand impacts to a less than significant level if facility operators that have access to recycled water are required to use recycled water, if available. In addition, the reuse of hydrotest water for multiple tanks for other uses within each facility can also help substantially reduced the water demand impacts to a less than significant level. However, there is no absolute guarantee at the time of this writing that future supplies of potable water or recycled water will be available to all of the affected facilities. Therefore, the proposed project will remain significant after mitigation for water demand during hydrotesting.

Hydrotesting Post-Construction – Water Quality: Since less than significant impacts are expected from wastewater generation or storm water from hydrotesting, no water quality mitigation measures are required during hydrotesting. Thus, water quality impacts during hydrotesting remain less than significant.

4.5.3.4 Hydrology and Water Quality Impacts During Operation

Of the technologies proposed as BARCT for NOx control, only WGSs utilize water and generate wastewater as part of their day-to-day operations. For this reason, only WGS technology was identified as having the potential to generate adverse hydrology and water quality operational impacts. The potential adverse affects on hydrology (water demand) and wastewater will be the focus of the evaluation in this subchapter. The analysis shows that

WGS technology may be installed for two FCCUs, five SRU/TGUs, and one coke calciner for the refinery sector. However, for the non-refinery sector, WGS technology was not identified as BARCT for the affected equipment. Table 4.5-9 summarizes the estimated number of WGSs that may be installed for the refinery, the amount of increased water demand, and the amount of increased wastewater to be generated as a result of implementing the proposed project.

Table 4.5-9
Estimated Number of WGSs to be Installed for the Refinery Sector and Associated Water Use/Wastewater Generation

Refinery ID	Potential NOx Control per Equipment/Source Category	Potential Increase in Operational Water Demand (gal/day)	Potential Increase in Wastewater Generation (gal/day)
1	SRU/TGU: 1 LoTOx^{TM} with WGS	70,000	13,973
2	Coke Calciner: 1 LoTOx^{TM} with WGS	40,896	16,992
4	FCCU: 1 LoTOx^{TM} with WGS	49,315	21,918
5	SRU/TGU: 2 LoTOx^{TM} with 2 WGSs	219,178	98,630
6	SRU/TGU: 1 LoTOx^{TM} with WGSs	109,589	49,315
8	SRU/TGU: 1 LoTOx^{TM} with WGS	70,000	13,973
9	FCCU: 1 LoTOx^{TM} with WGS	43,836	21,918
	TOTAL	**602,814**	**236,719**

<u>Water Demand</u>
As summarized in Table 4.5-10, each affected refinery provided its water demand baseline and these water usage rates were compared to each facility's estimated potential increase in water demand that may result from implementing the proposed project. The peak percentage increase from baseline levels when compared to the proposed project was approximately 3.70 percent (Refinery 2) but most of the affected facilities have a potential increase in water demand from less than one to two percent above each facility's baseline. The overall increase in water demand for is 1.31 percent above the total water use baseline for all of the affected refineries combined.

Table 4.5-10

Potential Increases in Operational Water Demand per Affected Refinery

Refinery ID	**Proposed Control Technology That Utilizes Water**	**Potential Increase in Water Use** (MMgal/day)	**Current Facility Water Use** (MMgal/day)	**Percentage Increase Above Baseline**
1	SRU/TGU: 1 LoTOx™ with WGS	0.07	12.5	0.56%
2	Coke Calciner: 1 LoTOx™ with WGS	0.04	1.08	3.70%
4	FCCU: 1 LoTOx™ with WGS	0.05	5.76	0.87%
5	SRU/TGU: 2 LoTOx™ with 2 WGSs	0.21	10.75	1.95%
6	SRU/TGU: 1 LoTOx™ with WGSs	0.11	10.32	1.07%
8	SRU/TGU: 1 LoTOx™ with WGS	0.07	2.88	2.43%
9	FCCU: 1 LoTOx™ with WGS	0.04	2.5	1.60%
	TOTAL*	**0.60**	**45.79**	**1.31%**

*Total adjusted due to rounding

As explained in Subchapter 3.5 – Hydrology and Water Quality, Governor Brown proclaimed a State of Emergency for California due to unprecedented drought conditions. New laws went into effect to begin regulating groundwater by adding restrictions on pumping in some areas to prevent aquifers from dwindling and wells from running dry. 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; 6) implementing a conservation campaign; 7) stopping water pumping from various streams; and, 8) adjusting water contract allocations. In addition, water shortages have prompted cities to begin infrastructure improvements to secure future water supplies.

Because of the drought and the uncertainty of future water supplies, it is not clear at this time whether water suppliers would be able to accommodate the additional operational water demand if the proposed project goes forward, especially if potable water or groundwater would be relied upon to supply the water demand. As part of making a determination if water supplies will be sufficient for the proposed project, the availability of recycled water is an important factor. Of the seven affected refineries, three facilities (e.g., Facilities 1, 5, and 6) currently access recycled water from the Harbor Refineries Recycled Water Pipeline (HRRWP) which is maintained by the Los Angeles Department of Water and Power (LADWP), in conjunction with the West Basin Municipal Water District (WBMWD). Should operators of these three facilities commit to utilizing recycled water in lieu of potable water to satisfy the water demand for the NOx control equipment, then the LADWP/WBMWD would be able to supply the additional water (e.g., 398,767 gallons per day or 66 percent of the projected water demand).

At the time of writing this PEA, SCAQMD has not been able to confirm whether three refineries (e.g. Facilities 4, 8 and 9) have connected to the HRRWP to access its supply of recycled water. Further, Facility 2 is not located near the HRRWP so it is unlikely that

Facility 2 would be able to obtain recycled water. Thus, while the amount of water demand that would be needed to operate NOx control equipment at Facilities 2, 4, 8, and 9 would be 204,047 gallons per day, which is less than the significance threshold of 262,820 gallons per day of potable water and the significance threshold of five million gallons per day of total water (e.g., potable, recycled, and groundwater), it is not known at this time whether water purveyors would be able to supply potable water for these facilities. Thus, using an abundance of caution, because the peak daily water demand for the proposed project exceeds the potable water threshold of 262,820 gallons per day and because SCAQMD staff is unable verify whether the peak daily water demand can be satisfied with recycled water for any of the refineries, including the three that already have access to recycled water, significant adverse impacts associated with water demand are expected from the proposed project during operation.

Water Quality

As summarized in Table 4.5-11, each affected facility provided their wastewater discharge limits and these limits were compared to each facility's estimated potential increase in wastewater that may result from implementing the proposed project. The peak percentage increase from baseline levels when compared to the proposed project was approximately 12 percent (Refinery 9). An increase of 25 percent above discharge permit limits would trigger a permit revision and would be considered a significant adverse wastewater impact. Since all of the affected facilities have been shown to have a potential wastewater increase less than 25 percent, no modifications to any existing wastewater discharge permits are anticipated as a result of the proposed project. Thus, the operational impacts of the proposed project on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant.

Table 4.5-11

Potential Increases in Wastewater Generation per Affected Refinery

Refinery ID	**Proposed Control Technology that Generates Wastewater**	**Potential Increase in Wastewater Generation** (MMgal/day)	**Wastewater Permit Discharge Limit**[1] (MMgal/day)	**Percentage Increase Above Discharge Limit**	**Greater than 25% Increase? (Exceeds CEQA Significance Threshold?)**
1	SRU/TGU: 1 LoTOx™ with WGS	0.01	8.8	0.16%	NO
2	Coke Calciner: 1 LoTOx™ with WGS	0.02	0.18	9.44%	NO
4	FCCU: 1 LoTOx™ with WGS	0.02	1.1	1.99%	NO
5	SRU/TGU: 2 LoTOx™ with 2 WGSs	0.10	7.5	1.31%	NO
6	SRU/TGU: 1 LoTOx™ with WGSs	0.05	15	0.33%	NO
8	SRU/TGU: 1 LoTOx™ with WGS	0.01	2.88	0.49%	NO
9	FCCU: 1 LoTOx™ with WGS	0.02	0.18	12.18%	NO
	TOTAL[2]	**0.24**	**35.64**	**0.67%**	

[1] Wastewater limits were obtained from each facility's wastewater permit(s). For any facility that has multiple discharge limits (i.e. dry weather, wet weather, etc.), the most conservative limit will be used for the purposes of this comparison.

[2] Total adjusted due to rounding

No changes to each affected facility's storm water collection systems are expected because the physical changes that will occur at a facility will be associated with existing units (i.e., to install new control equipment on existing equipment or upgrading existing control equipment) and these changes will not affect existing storm water collection systems. Further, typically most of the areas likely to be affected by the proposed project are currently paved and are expected to remain paved. Any new units constructed will be curbed and the existing units will remain curbed to contain any runoff. Any runoff occurring will continue to be handled by each affected facility's wastewater system and sent to an on-site wastewater treatment system prior to discharge. The surface water runoff is expected to be handled with each facility's current wastewater collection or treatment system. Storm water runoff will be collected and discharged in accordance with each facility's discharge permit terms and conditions.

<u>Operation Conclusion</u>
In summary, significant adverse water demand impacts and less than significant water quality impact are expected during operation of the proposed project.

4.5.3.5 Mitigation of Operation Hydrology and Water Quality Impacts

The proposed project is expected to have significant adverse water demand impacts during operation. If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the significant adverse impacts (CEQA Guidelines §15126.4). The following mitigation measures will apply to any facility whose operator chooses to install NOx control equipment that utilizes water for its operation. If, at the time when each facility-specific project is proposed in response to the proposed project, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project and determine if the project is covered by the analysis in this PEA. In addition, these mitigation measures will be included in a mitigation monitoring plan as part of issuing SCAQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by SCAQMD personnel.

<u>Water Demand:</u> Potentially significant adverse impacts associated with operational water demand are expected from the proposed project during operation. Thus, mitigation measures for water demand are required. For any facility that installs a WGS as part of the proposed project, SCAQMD staff requires that the facility operators utilize both current supplies and future supplies of recycled water in accordance with the California Water Code, and if available, pursuant to the HRRWP or other recycled water pipeline, if available, for operation of a WGS. Based on the preceding discussion, the following water demand mitigation measures will apply to the proposed project:

HWQ-3 When NOx control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the NOx control equipment.

HWQ-4 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to submit a written declaration with the application for a Permit to Construct for the NOx control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

Water Quality: Less than significant adverse impacts associated with operational water quality are expected from the proposed project during operation, so no mitigation measures during operation are required.

4.5.3.6 Remaining Operation Hydrology and Water Quality Impacts After Mitigation

Water Demand: The water demand analysis shows that the potential increase in potable water use cannot be fully supplied either with all potable water or with a combination of recycled water and potable water, since some potable water may still be required for certain facilities. The use of recycled water can help substantially reduce the water demand impacts to a less than significant level if facility operators that have access to recycled water are required to use recycled water, if available. However, there is no absolute guarantee at the time of this writing that future supplies of potable water or recycled water will be available to all of the affected facilities. Therefore, the proposed project will remain significant after mitigation for water demand.

Water Quality: The water quality analysis concluded that potential water quality impacts during operation would be less than significant, so no mitigation measures are required. Thus, water quality impacts during operation remain less than significant.

4.5.4 Cumulative Hydrology and Water Quality Impacts

Water Demand: Because the project-specific water demand impacts have been concluded to be significant due to the uncertainty of recycled water supplies for some of the affected facilities and in consideration of California's on-going drought, it could be argued that the potential water demand impacts from implementing the proposed project is cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1). Therefore, the proposed project is expected to generate significant adverse cumulative water demand impacts.

Water Quality: Because the project-specific water quality impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative water quality impacts.

4.5.5 Cumulative Mitigation Measures

Water Demand: Because the project-specific water demand impacts during hydrotesting and during operation are considered to be cumulatively considerable, cumulative mitigation measures are required. Thus, the following cumulative water demand mitigation measures will apply to any facility whose operator chooses to install NOx control equipment that utilizes water for its operation. If, at the time when each facility-specific project is proposed in response to the proposed project, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project and determine if the project is covered by the analysis in this PEA. In addition, these mitigation measures will be included in a mitigation monitoring plan as part of issuing SCAQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by SCAQMD personnel.

HWQ-1 When a storage tank is installed to support operations of installed NOx control equipment and hydrotesting is required prior to its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for hydrotesting.

HWQ-2 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to submit a written declaration with the application for a Permit to Construct for the storage tank, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

HWQ-3 When NOx control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the NOx control equipment.

HWQ-4 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to submit a written declaration with the application for a Permit to Construct for the NOx control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

<u>Water Quality:</u> Because the project-specific water quality impacts during construction and operation are not considered to be cumulatively considerable, no cumulative mitigation measures are required.

SUBCHAPTER 4.6

SOLID AND HAZARDOUS WASTE

4.6 SOLID AND HAZARDOUS WASTE

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in adverse solid and hazardous waste impacts. The solid and hazardous waste analysis in this PEA identifies the net effect of solid and hazardous waste from implementing the proposed project.

4.6.1 Introduction

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. The different types of control devices include SCR, LoTOx™ with or without a WGS, and catalyst impregnated filters with an UltraCat DGS. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx at the affected facilities, which will provide air quality and human health benefits to the public. However, installing new or modifying existing air pollution control equipment is expected to have potentially adverse solid and hazardous waste impacts. The analysis of these impacts can be found in Section 4.6.3. Refer to Appendix E for the calculations used to estimate the amount of solid and hazardous waste that may be generated during construction and operation of the proposed project.

4.6.2 Significance Criteria

The proposed project impacts on solid and hazardous waste will be considered significant if the following occurs:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

4.6.3 Potential Solid and Hazardous Waste Impacts and Mitigation Measures

4.6.3.1 Potential Solid and Hazardous Waste Impacts During Construction

Construction activities associated with installing NOx control equipment such as demolition and site preparation/grading/excavating could generate solid waste as result of implementing the proposed project. Demolition activities could generate demolition waste while site preparation, grading, and excavating could uncover contaminated soils since the facilities affected by the proposed project are located in existing industrial areas. Excavated soil, which may be contaminated, will need to be characterized, treated, and disposed of offsite in accordance with applicable regulations. Where appropriate, the soil will be recycled if it is considered or classified as non-hazardous waste or it can be disposed of at a landfill that accepts non-hazardous waste. Otherwise, the material will need to be disposed of at a hazardous waste facility. (Potential soil contamination is addressed in the NOP/IS (see Appendix F of this PEA), in the Hazards/Hazardous Materials discussion in Section VIII. d. and was concluded to have less than significant impacts.)

Solid or hazardous wastes generated from construction-related activities at the 20 affected facilities would consist primarily of materials from the demolition of existing air pollution control equipment (if applicable) and construction associated with installing new air pollution control equipment or modifying existing air pollution control equipment. Construction-related waste can be disposed of either at a Class II (industrial) or Class III (municipal) landfill. Any equipment that is removed during demolition may be dismantled and metals may be sold as scrap. Class II landfills may accept designated and nonhazardous wastes and Class III landfills may accept nonhazardous wastes. However, there are no Class II landfills within the SCAQMD's jurisdiction. There are 31 Class III active landfills and two transformation facilities located within the district with a total capacity of 107,933 tons per day and 3,240 tons per day, respectively (see Subchapter 3.6, Tables 3.6-2 and 3.6-3)[1]. While the actual amount of construction debris that may be generated from installing new or modifying existing NOx control equipment at 20 facilities cannot be calculated, the amount of debris generated would not be expected to exceed the designated capacity of these landfills. For this reason, the construction impacts of the proposed project on waste treatment/disposal facilities are expected to be less than significant.

4.6.3.2 Mitigation of Solid and Hazardous Waste Impacts During Construction

Less than significant adverse impacts associated with solids and hazardous wastes are expected from the proposed project during construction, so no mitigation measures are required.

4.6.3.3 Remaining Solid and Hazardous Waste Impacts During Construction After Mitigation

The solids and hazardous wastes analysis concluded that potential solids and hazardous wastes impacts during construction would be less than significant, no mitigation measures were required. Thus, solids and hazardous wastes impacts during construction remain less than significant.

4.6.3.4 Potential Solid and Hazardous Waste Impacts During Operation

If the proposed project is implemented, solid waste may also be generated from the operation of the new NOx air pollution control equipment at both the refinery and non-refinery facilities, depending on the type of NOx control equipment employed. Tables 4.6-1 and 4.6-2 summarize the potential increased amount of solid waste expected to be generated for the refinery and non-refinery sector, respectively.

[1] 2012 Annual Report, Los Angeles County Countywide Integrated Waste Management Plan, Appendix E-2 Table 1 (LACDPW, 2013).

Table 4.6-1
Potential Increase in Solid Waste at Refinery Facilities

Refinery ID	Proposed Increase in Amount of Solids Collected Due to New NOx Controls (tons/day)	Is the proposed increase in Solid Waste Hazardous?	Solid Waste will be trucked to:
1	0.68	NO	Cement Plant for Recycling
2	0.44	NO	Cement Plant for Recycling
3	0	NO	Not Applicable
4	0.44	NO	Cement Plant for Recycling
5	1.75	NO	Cement Plant for Recycling
6	0.88	NO	Cement Plant for Recycling
7	0	NO	Not Applicable
8	0.33	NO	Cement Plant for Recycling
9	1.89	NO	Cement Plant for Recycling
Total	**6.41**		

Table 4.6-2
Potential Increase in Solid Waste at Non-Refinery Facilities

Non-Refinery ID	Proposed Increase in Amount of Solids Collected Due to New NOx Controls (tons/day)	Is the proposed increase in Solid Waste Hazardous?	Solid Waste will be trucked to:
1	0	NO	Not Applicable
2	0	NO	Not Applicable
3	0	NO	Not Applicable
4	0	NO	Not Applicable
5	0	NO	Not Applicable
6	0	NO	Not Applicable
7	0	NO	Not Applicable
8*	1.2	NO	Cement Plant for Recycling or Class III Landfill
9	0	NO	Not Applicable
10	0	NO	Not Applicable
11	0	NO	Not Applicable
Total	**1.2**		

* Solid waste would only be generated if the operator of non-refinery Facility 8 chooses to install an Ultracat system. However, if the operator of non-refinery Facility 8 chooses to install SCR technology, in lieu of the Ultracat system, then no solid waste would be generated.

In addition, if the proposed project is implemented, waste from spent catalyst may also be generated every five years from the operation of SCR technology at both the refinery and non-refinery facilities. For both solid waste and spent catalyst waste, it is possible that some, if not all, of the 20 affected facilities will address any increase in waste through their existing waste minimization plans. For example, some of the affected facilities in both the refinery and non-refinery sectors currently have existing catalyst-based operations and the spent catalysts are either regenerated, reclaimed or recycled, in lieu of disposal. Moreover, due to the heavy metal content and its relatively high cost, catalyst recycling can be a lucrative choice. Depending on operating conditions, it is expected that for any new SCR system installed, the spent catalysts would also be reclaimed and recycled, though it is possible that spent catalysts could be disposed of. The composition of the catalyst will determine in which type of landfill a catalyst would be disposed.

A catalyst with a metal structure would not normally be considered a hazardous waste. Instead, it would be considered a metal waste, like copper pipes, and, therefore, would not be a regulated waste requiring disposal in a Class I landfill unless it is friable or brittle. Ceramic-based catalysts are not considered friable or brittle because they typically include a fiber binding material in the catalyst material. In both cases, spent catalyst would not require disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill.

Based on the preceding discussion, it is likely that spent catalysts would be considered a "designated waste," which 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 (California Code of Regulations, Title 23, Chapter 3 Subparagraph 2522(a)(1)). Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class III landfill that is fitted with liners.

Disposal of spent catalyst would typically involve crushing the material and encasing it in concrete prior to disposal. Since it is expected that most spent catalysts will be recycled and regenerated, it is anticipated that there will be sufficient landfill capacity in the district to accommodate disposal of any spent catalyst materials. Thus, the potential increase of solid waste generated by the air pollution control equipment operated at the 20 affected facilities that are expected to install NOx control equipment as a result implementing the proposed project may not necessarily be disposed of and, therefore, is not expected to exceed the capacity of designated landfills available to each affected facility.

As summarized in Table 4.6-1, the projected solid waste data obtained by the consultant from each affected refinery facility also indicated that approximately six tons per day of solid waste may be generated by the NOx air pollution control equipment. However, because the solid waste that may be generated at the refinery facilities is expected to be a commodity, it is also not expected to be disposed of in a landfill. Instead, the additional solid waste that may be generated from the refinery facilities will be sent to a cement plant located outside of SCAQMD's jurisdiction for recycling. In any case, even if the entire amount of solid waste that may be generated by the refinery facilities as a result of the proposed project is sent to a landfill, the amount would not exceed the capacity of these designated landfills. For this reason, the operational impacts from the refinery facilities on waste treatment/disposal facilities are expected to be less than significant.

For the non-refinery facilities, potential solid waste generation data is summarized in As summarized in Table 4.6-1, and shows that only one non-refinery facility, Facility 8, could potentially generate solid waste (approximately 1.2 tons per day) if an Ultracat system is installed. However, if operators of Facility 8 choose to install SCR technology, in lieu of an Ultracat system, then no solid waste would be generated from the SCR technology and only spent catalyst waste would be generated once every five years. Operators of Facility 8 have indicated that solid waste that may be generated from the Ultracat system could either be sent to a cement plant for recycling or to a Class III landfill. As such, the relatively small amount of solid waste that may be generated from the non-refinery sector would not exceed the capacity of the designated landfills. Thus, the operational impacts from the one non-refinery facility on waste treatment/disposal facilities are also expected to be less than significant.

Further, implementing the proposed project is not expected to hinder in any way any affected facility's ability to comply with existing federal, state, and local regulations related to solid and hazardous wastes. Based upon these considerations, the overall operational impacts of the proposed project on waste treatment/disposal facilities due to solid waste that may be generated from both refinery and non-refinery facilities are expected to be less than significant.

4.6.3.5 Mitigation of Operational Solid and Hazardous Waste Impacts

Less than significant adverse impacts associated with solids and hazardous wastes are expected from the proposed project during operation, so no mitigation measures are required.

4.6.3.6 Remaining Operational Solid and Hazardous Waste Impacts After Mitigation

The solids and hazardous wastes analysis concluded that potential solids and hazardous wastes impacts during operation would be less than significant, no mitigation measures were required. Thus, solids and hazardous wastes impacts during operation remain less than significant.

4.6.4 Cumulative Solid and Hazardous Waste Impacts

Because the project-specific solid and hazardous waste impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative solid and hazardous waste impacts.

4.6.5 Cumulative Mitigation Measures

Because the project-specific solid and hazardous waste impacts during construction and operation are not considered to be cumulatively considerable, no cumulative mitigation measures are required.

SUBCHAPTER 4.7

TRANSPORTATION AND TRAFFIC

4.7 TRANSPORTATION AND TRAFFIC

The proposed amended regulation will require facilities to collectively lower their emissions, thus improving air quality in the long term in order to meet the project's objectives. However, the installation of air pollution control equipment as a result of implementing the proposed project could potentially result in transportation and traffic impacts. The transportation and traffic analysis in this PEA identifies the net effect of transportation and traffic impacts from implementing the proposed project.

4.7.1 Introduction

As previously summarized in Table 4.0-2, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment for the top NOx emission equipment/source categories. The equipment/source categories are divided into two sectors: refinery and non-refinery. There are nine facilities in the refinery sector and 11 facilities in the non-refinery sector. For both sectors, individual facilities were evaluated to determine the number and type of NOx control devices that may be installed as a result of implementing the proposed project. Reducing NOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of NOx at the affected facilities, which will provide air quality and human health benefits to the public. However, installing new or modifying existing air pollution control equipment is expected to have potentially adverse transportation and traffic impacts.

The environmental analysis assumes that installation of NOx control technologies for the affected sources will reduce NOx emissions overall, but construction activities associated with both the installation of new control devices and the modification of existing control devices will create adverse transportation and traffic impacts. A project generates adverse transportation and traffic impacts both during the period of its construction and through ongoing daily operations. During installation or modification of add-on air pollution control devices, transportation and traffic impacts may be generated by delivering onsite construction equipment and by offsite vehicles used for worker commuting. After construction activities are completed, transportation and traffic impacts may be generated by maintenance activities associated with the operation of the add-on air pollution control devices such as offsite vehicles used for delivering fresh materials needed for operations (e.g., chemicals, fresh catalyst, etc.) and hauling away solid waste for disposal or recycling (e.g., spent catalyst). The analysis of these impacts can be found in Section 4.7.3. Refer to Appendix E for the calculations used to estimate secondary construction- and operational-related transportation and traffic impacts.

4.7.2 Significance Criteria

Impacts on transportation and traffic will be considered significant if any of the following criteria apply:

- 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.

4.7.3 Potential Transportation and Traffic Impacts and Mitigation Measures

Table 4.7-1 summarizes the estimated number of NOx emission control devices per sector and per equipment/source category. The different types of control devices include Selective Catalytic Reduction (SCR), a proprietary Low Temperature Oxidation technology (LoTOx^{TM}) with or without a Wet Gas Scrubber (WGS), and catalyst impregnated filters with a Dry Gas Scrubber (UltraCat DGS). In total, the proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx^{TM} with WGSs, one LoTOx^{TM} without WGS, and three UltraCat DGSs.

Table 4.7-1

Estimated Number of NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Number of Affected Facilities	Estimated Number of Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	5	2 SCRs 2 LoTOx™ with WGSs 1 LoTOx™ without WGS
Refinery	Refinery Process Heaters and Boilers	8	74 SCRs
Refinery	Refinery Gas Turbines	5	7 SCRs
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	5	5 LoTOx™ with WGSs 1 SCR
Refinery	Petroleum Coke Calciner	1	1 LoTOx™ with WGS or 1 UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	1	2 SCRs or 1 UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	1	1 SCR or 1 UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	1	1 SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	3	16 SCRs
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	7	13 SCRs and 1 SCR replacement
		TOTAL	**114 to 117 SCRs** **7 to 8 LoTOx™ with WGSs** **1 LoTOx™ without WGS** **3 UltraCat DGSs**

4.7.3.1 Construction Analysis

Construction activities resulting from implementing the proposed project may generate a temporary increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, the proposed project is not expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities. Also, the proposed project is not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during construction as explained in the following discussion.

Table 4.7-2 summarizes the number of construction workers and delivery/haul trips that may be needed to install the various NOx control equipment during construction for both the refinery and non-refinery sectors.

Table 4.7-2

Estimated Number of Worker Trips and Delivery/Haul Trips Needed During Construction of NOx Control Devices in a Peak Day

Sector	Equipment/Source Category	Type of NOx Control Technology	Peak Daily Construction Workers Trips Needed Per NOx Control	Peak Daily Delivery/ Haul Trips Needed
Refinery	FCCUs	1. SCR 2. LoTOx™ with WGS 3. LoTOx™ without WGS	1. 140 2. 175 3. 20	1. 10 2. 10 3. 10
Refinery	Refinery Process Heaters and Boilers	SCR	20	10
Refinery	Refinery Gas Turbines	SCR	20	10
Refinery	SRU/TGUs	1. LoTOx™ with WGS 2. SCR	1. 175 2. 140	1. 10 2. 10
Refinery	Petroleum Coke Calciner	1. LoTOx™ with WGS 2. UltraCat DGS	1. 175 2. 175	1. 10 2. 10
Non-Refinery	Container Glass Melting Furnaces	1. SCR 2. UltraCat DGS	1. 18 2. 175	1. 5 2. 10
Non-Refinery	Sodium Silicate Furnaces	1. SCR 2. UltraCat DGS	1. 18 2. 175	1. 5 2. 10
Non-Refinery	Metal Heat Treating Furnaces	SCR	18	5
Non-Refinery	ICEs (Non-Refinery/Non-Power Plant)	SCRs	18	5
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	SCR	18	5

There are multiple source categories with multiple approaches to reducing NOx at the refinery facilities. With so many possibilities or permutations of how operators of the refinery could achieve actual NOx reductions, there is no way to predict what each facility operator will actually do. For this reason, the analysis illustrates the worst-case effects of applying the various NOx control technologies to each affected facility.

From a construction point of view, the installation of a NOx control technology at a facility is a rather complex process. For example, if a facility operator chooses to install NOx control equipment, time will be needed for pre-construction/advance planning activities such as engineering analysis of the affected equipment, engineering design of the potential control equipment, contracting with a vendor, securing financing, ordering and purchasing the equipment, obtaining permits and clearances, and lining up contractors and workers. The amount of lead time can vary from six months (e.g., for a SCR for refinery/boiler heater or gas turbine) to up to 18 months for a scrubber (either a WGS or DGS).

Then to physically build the equipment, an additional six to 18 months would be needed. For example, six months would be needed to construct one SCR for one refinery boiler/ heater or gas turbine, 12 months would be needed to construct a SCR for a FCCU, and up to 18 months would be needed to construct a scrubber (either a WGS or DGS) for a FCCU or SRU/TGU. Where the new equipment will be sited will determine if any demolition activities would be required. For this analysis, scrubber installation would have the most impacts relative to the number of construction workers and delivery/haul trips needed. Thus, to be conservative, to construct one WGS, one month of demolition activities is assumed to occur at each affected facility and an additional 17 months is assumed for site preparation, assembly and installation of the unit and ancillary support equipment, preparation of the affected unit for a turnaround/shutdown, and tying-in the new scrubber to the affected equipment. As a practical matter, construction activities that are anticipated to occur as a result of implementing the proposed project would likely occur prior to a scheduled maintenance (e.g., turnaround) of the affected unit.

Typically construction projects have staggered construction schedules which take into account design and engineering, ordering, purchasing and delivery of equipment, permitting and environmental review, the availability of construction crews, budgeting, and any other construction projects on site. However, due to wide range of construction time necessary to build the various types of NOx control equipment, the construction activities at other affected facilities could overlap. However, because of widely varying turnaround schedules of affected equipment within any given facility and based on past construction projects involving major construction equipment where the SCAQMD was the lead agency, the air quality analysis in Subchapter 4.2 of this PEA includes a conservative assumption that all of the refineries will have overlapping construction activities occurring in one year. However, since having all facilities construct all NOx controls within the first year is unlikely, for demonstrative purposes, the air quality analysis also includes an analysis of the overlapping construction impacts spread out over a five- and seven-year period.

However, for conducting a worst-case transportation and traffic analysis, the significance criteria is on a per facility basis because the facilities are not located close enough together to have large amounts of overlapping traffic. Of the 20 facilities that may install NOx control equipment as a result of the proposed project, Refinery 5 represents the worst-case for construction activities because it has the most equipment/source categories identified as potential candidates for installing NOx control equipment. Based on conversations with operators at Refinery 5, from a construction worker point of view, the turnaround schedule for the FCCU and SRU/TGUs could overlap but both SRU/TGUs would not be shut-down at the same time. Thus, the analysis assumes that construction overlap of the two SRU/TGUs prior to when the turnarounds would not be expected to occur. For the purpose of conducting a worst-case analysis, construction of one SCR for the FCCU and construction for one LoTOx^{TM} system with one WGS scrubber is assumed to overlap. Further, Refinery 5 is projected to retrofit three gas turbines and 12 boilers and heaters with SCR, for a total of 15 units. Peak SCR construction for refinery boilers, heaters and gas turbines was based on a one-third overlap or five SCRs being installed at one time.

Table 4.7-3 summarizes the number of construction workers and delivery/haul trips that may be needed to install the various NOx control equipment during construction at Refinery 5 on a peak day.

Table 4.7-3

Estimated Number of Worker Trips and Delivery/Haul Trips Needed During Construction of NOx Control Devices in a Peak Day For Refinery 5

Affected Equipment/Source Category at Refinery 5	Type of NOx Control Technology	Overlap of Construction for NOx Controls on a Peak Day	Peak Daily Construction Workers Trips Needed Per NOx Control	Peak Daily Delivery/ Haul Trips Needed
1 FCCU	1 SCR	1 SCR	140	10
2 SRU/TGUs	2 LoTOx™ with WGS	1 LoTOx™ with 1 WGS	175	10
1 SRU/TGU	1 SCR	0	0	0
3 Gas Turbines*	3 SCR	1	20	10
12 Boilers/Heaters *	12 SCRs	4	80	40
		TOTAL	**415**	**70**
		Significance Threshold?	700	350
		Significant?	**NO**	**NO**

* While Refinery 5 could install a total of 15 new SCRs for their boilers/heaters/gas turbines, peak construction is based on a 1/3rd overlap of 5 SCRs at one time.

As shown in Table 4.7-3, the peak daily increase in construction workers at a peak facility (Refinery 5) is 415 the peak daily increase in delivery and haul trips utilizing a heavy-duty is 70. Both of these values are less than their respective significance thresholds.

Even if all 415 construction workers drive alone (which represents an average vehicle ridership equal to 1.0), it is unlikely that these vehicle trips would substantially affect the LOS at any intersection because the trips will be somewhat dispersed over a large area. Therefore, the peak daily work force is not expected to significantly increase as a result of the proposed project.

Therefore, the peak daily work force during construction is not expected to significantly increase as a result of the proposed project. Further, the peak daily number of heavy-duty truck trips during construction is also not expected to significantly increase as a result of the proposed project.

Further, the conclusion of no significant transportation impacts based on the workforce is consistent with the transportation analyses in the CEQA documents prepared for six refineries in accordance with the CARB Phase III Reformulated Gasoline requirements[1]. Specifically, the number of construction workers for each of the six projects ranged from approximately 200 to 700 daily construction worker trips and each of these projects was concluded to have no significant transportation impacts.

4.7.3.3 Mitigation of Transportation and Traffic Impacts During Construction

Less than significant adverse impacts associated with transportation and traffic impacts are expected from the proposed project during construction, so no mitigation measures during construction are required.

4.7.3.6 Remaining Construction Transportation and Traffic Impacts After Mitigation

The transportation and traffic analysis concluded that potential transportation and traffic impacts during construction would be adverse, but less than significant, so mitigation measures during construction are not required. Thus, transportation and traffic impacts during construction remain less than significant.

4.7.3.4 Operation Analysis

Non-Refinery Facilities

The following activities may be sources of transportation and traffic impacts during operation of NOx control equipment at 11 non-refinery facilities: 1) vehicle trips via heavy-duty truck for periodic ammonia/urea deliveries for each SCR and Ultracat filtration unit installed; 2) vehicle trips via heavy-duty truck for periodic deliveries of hydrated lime, catalyst, and replacement filters as well as solid waste hauling of spent filters for each Ultracat system installed. In addition to heavy-duty truck trips, the analysis assumes that one medium-duty round-trip for control system maintenance personnel may be needed for each of the 11 non-refinery facilities. A summary of these heavy-duty truck trips are presented in Table 4.7-4.

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[1]
1. Final EIR for Chevron El Segundo CARB Phase 3 Clean Fuels Project, certified November 30, 2001. http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/chevron/final/chev_f.html
2. Final Environmental Impact Report for: Proposed Ultramar Wilmington Refinery - CARB Phase 3 Project, certified December 19, 2001 http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/ultramar/final/ultEIR_f.html
3. Final Environmental Impact Report for: Proposed Equilon Enterprises LLC CARB Phase 3 Reformulated Gasoline Project, certified October 15, 2001. http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/equilon/final/equEIR_f.html
4. Final Environmental Impact Report for: Mobil CARB Phase 3 Reformulated Gasoline Project, certified October 12, 2001. http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/mobil/final/mobil_f.html
5. Final Environmental Impact Report for: ARCO CARB Phase 3/MTBE Phase-out Project, certified May 15, 2001. http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/arco/finalEIR/arcoFEIR.html
6. Final Environmental Impact Report for: Proposed Tosco Los Angeles Refinery - Phase 3 Reformulated Fuels Project, certified April 5, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/tosco_rfp/final/toscoEIR_f.html)

Table 4.7-4
Operational Truck Trips at 11 Non-Refinery Facilities

Truck Trips	NH3/Urea Delivery Trips[1]	Hydrated Lime Delivery Trips [1,2]	Solid Waste Haul Trips[1]	Filter Waste Haul Trips[1]	Catalyst Delivery Trips[3]	Control System Maintenance Trips[4]	Total Trips
Annual	437	5	11	1	11	11	476
Peak Daily	11	1	1	1	11	1	26

[1] Peak daily trips assumed one ammonia/urea delivery occurs at each non-refinery facility and adsorbent, solid waste and filter waste haul trips occurs on the same day.
[2] Adsorbent, solid waste and filter waste based on vendor estimates for SOx portion of Ultracat system.
[3] Only five catalyst delivery trips are expected because catalysts are replaced every two to three years.
[4] A medium-duty truck is assumed for control system maintenance.

Refinery Facilities

The following activities may be sources of transportation and traffic impacts during operation of NOx control equipment at 9 refinery facilities: 1) vehicle trips via heavy-duty truck for periodic deliveries of ammonia for each SCR installed, NaOH for two LoTOx^{TM} WGSs installed, soda ash for two LoTOx^{TM} WGSs installed, hydrated lime for the Ultracat DGS installed, and oxygen for every LoTOx^{TM} unit installed; 2) vehicle trips via heavy-duty truck for periodic deliveries of catalyst and replacement filters as well as solid waste hauling of spent filters for each SCR unit installed; and 3) via heavy-duty truck hauling solid waste generated by each scrubber (WGS and DGS) installed. A summary of these heavy-duty truck trips are presented in Table 4.7-5.

Table 4.7-5
Heavy-Duty Operational Truck Trips at 9 Refinery Facilities

	Number of Heavy-Duty Truck Trips								
	NH3[1]	NaOH[1]	Hydrated Lime[1]	Soda Ash[1]	Oxygen [1]	Fresh Catalyst[2]	Solid Waste[1]	Spent Catalyst[2]	TOTAL
Annual	498	56	26	21	44	49	96	49	839
Peak Daily	17	3	1	4	1	16	7	16	65

[1] Peak daily trips assumed one heavy-duty truck trip occurs at each refinery facility for each chemical delivery or waste/spent catalyst haul trip.
[2] SCR fresh catalyst delivery trips are expected when the SCR is first built and then replaced every five years. Similarly, spent catalyst waste is also generated every five years.

As shown in Table 4.7-6, the amount of truck trips associated with the proposed project if all 20 facilities install NOx control equipment is 91 round trips in a peak day and 1,315 in one year.

Table 4.7-6
Operational Truck Trips at 20 Affected Facilities

Sector	Peak Daily Truck Trips	Annual Truck Trips
9 Refineries	65	839
11 Non-Refineries	26	476
TOTAL	**91**	**1,315**

Since the increase in transport truck traffic to and/or from each of the 20 affected facilities and from all 20 affected facilities combined is not greater than 350 truck round trips per day, less than significant transportation impacts are expected from implementation of the proposed project during operation. Further, taking into consideration the "worst-case" delivery and hauling transportation schedule, delivery and hauling trips associated with the proposed project are not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during operations. Thus, the projected increase of traffic due to operational activities is expected to be minimal and thus, the traffic impacts are expected to be less than significant for the proposed project.

4.7.3.5 Mitigation of Transportation and Traffic Impacts During Operation

Less than significant adverse impacts associated with transportation and traffic impacts are expected from the proposed project during operation, so no mitigation measures are required.

4.7.3.6 Remaining Operational Transportation and Traffic Impacts After Mitigation

The transportation and traffic analysis concluded that potential transportation and traffic impacts during operation would be adverse, but less than significant, so mitigation measures are not required. Thus, transportation and traffic impacts during operation remain less than significant.

4.7.4 Cumulative Transportation and Traffic Impacts

Because the project-specific transportation and traffic impacts do not exceed any applicable significance thresholds during construction and operation, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative transportation and traffic impacts.

4.7.5 Cumulative Mitigation Measures

Because the project-specific transportation and traffic impacts during construction and operation are not considered to be cumulatively considerable, no cumulative mitigation measures are required.

SUBCHAPTER 4.8

OTHER CEQA TOPICS

Potential Environmental Impacts Found Not to be Significant

Significant Environmental Effects Which Cannot Be Avoided

Potential Growth-Inducing Impacts

Relationship Between Short-Term Uses and Long-Term Productivity

4.8 OTHER CEQA TOPICS

4.8.1 Potential Environmental Impacts Found Not to be Significant

While all the environmental topics required to be analyzed under CEQA were reviewed to determine if the proposed project would create significant impacts, the screening analysis in the NOP/IS concluded that the following environmental areas would not be significantly adversely affected by the proposed project: agriculture and forestry resources, biological resources, cultural resources, geology and soils, land use and planning, mineral resources, noise, population and housing, public services, and recreation. Eight comment letters were received from the public relative to the NOP/IS. The comment letters and responses to individual comments are included in Appendix G of this document. No comment letters were received that identified other potentially significant adverse impacts from the proposed project.

In addition, subsequent to the release of the NOP/IS, the requirements of California Assembly Bill (AB 52) went into effect on July 1, 2015. AB 52 is promulgated in Public Resources Code §21080.3.1 (d) and requires a formal notification to all California Native American Tribes about lead agency projects that would require the preparation of a CEQA document. While the Office of Planning and Rule (OPR) has until July 1, 2016 to finalize the implementation guidance for this requirement, the SCAQMD is required to comply with AB 52 in the interim.

The Native American Heritage Commission (NAHC) has provided interim guidance to SCAQMD staff recommending that notifications to California Native American Tribes should occur at the same time the SCAQMD releases a CEQA document for public review and comment. The SCAQMD currently follows the State Clearinghouse (SCH) procedures for distributing all CEQA documents to reviewing agencies and the NAHC was specifically designated as a reviewing agency at the time the NOP/IS was released for public review and comment. Of the eight comment letters that were received relative to the NOP/IS, none were from the NAHC. In addition to following the SCH procedures for soliciting agency review of CEQA documents, SCAQMD staff also sent a copy of the NOP for this project to an interested party contact list, which included over 100 contacts for Native American Tribes. Again, no comment letters from any contacts on the Native American Tribes list were received relative to the NOP/IS.

Since the NOP/IS was released for public review and comment prior to July 1, 2015, the Cultural Resources checklist, significance criteria, and discussion that was originally published in the NOP/IS did not reflect the requirements of AB 52. As such, the Cultural Resources checklist, significance criteria, and discussion have been updated in this PEA to specifically address Native American cultural resources in accordance with the requirements of AB 52. However, the conclusion of "No Impact" for all questions under this topic area remains unchanged. Further, SCAQMD staff will continue to follow the same procedures for designating the NAHC as a reviewing agency and for notifying all of the Native American Tribes contained in SCAQMD's interested party database as to the availability of the Draft PEA for public review and comment.

The following is a brief discussion of each environmental topic area found not to be significant in the NOP/IS:

Agriculture and Forestry Resources

Land use, including agriculture- and forest-related uses, and other planning considerations are determined by local governments. While implementation of the proposed project may cause air pollution control equipment to be installed and operated on existing equipment to control NOx emissions, these activities will occur at established NOx RECLAIM facilities which are located on previously developed land in primarily industrial areas and are not located in the vicinity of agricultural or forest areas.

Further, no new construction of buildings or other structures is expected that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses or a Williamson Act contract. Further, because the proposed project does not require construction or operation activities within an area designated as forest land, implementation of the proposed project is not expected to conflict with any forest land zoning codes or convert forest land to non-forest uses. Similarly, there is nothing in the proposed project 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. Thus, no agricultural land use or planning requirements will be altered by the proposed project.

Finally, in the event the proposed project is implemented, the installation of NOx control equipment will ensure that projected NOx emission reductions will occur and that air quality in the region will improve. Thus, assuring that these air quality improvements occur could provide benefits to agricultural and forest land resources by reducing the adverse oxidation impacts of ozone on plants and animals located in the Basin. Accordingly, these impact issues will not be further analyzed in the Draft PEA.

Based upon these considerations, significant agricultural and forestry resources impacts are not expected from implementing the proposed project, and thus, this topic was not further analyzed in the Draft PEA. Since no significant agriculture and forestry resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

Biological Resources

The proposed project would only affect units operating at the top NOx emitting facilities in the NOx RECLAIM program. These facilities have locations scattered throughout the District. All of the affected units operating at existing facilities are located primarily in developed industrial areas, which have already been greatly disturbed and paved. These areas currently do not support riparian habitat, federally protected wetlands, or migratory corridors. Additionally, special status plants, animals, or natural communities are not expected to be found within close proximity to the affected sites within the facilities. Therefore, the proposed project would have no direct or indirect impacts that could adversely affect plant or animal species or the habitats on which they rely in the SCAQMD's jurisdiction. The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions. A conclusion in the Final Program EIR for the 2012 AQMP was that population growth in the region would have greater adverse effects on plant species and wildlife dispersal or migration corridors in the basin than SCAQMD regulatory activities, (e.g., air quality control measures or regulations). In addition, by reducing air pollutants, biological resources will benefit. Moreover, the current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions.

Further, the proposed project is not envisioned to conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans. 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. Additionally, the proposed project will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan, and would not create divisions in any existing communities because all activities associated with complying with the proposed project will occur at existing industrial facilities.

Based upon these considerations, significant biological resources impacts are not expected from implementing the proposed project, and thus, this topic was not further analyzed in the Draft PEA. Since no significant biological resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

Cultural Resources

Subsequent to release of the NOP/IS, modifications were made to the environmental checklist, significance criteria, and discussion of Cultural Resources impacts in response to the requirements in AB 52 to consider the proposed project's potential effects on Cultural Native American Tribe resources. To facilitate identification of what updates have been made to the environmental checklist, significance criteria, and discussion of Cultural Resources impacts in response to the requirements in AB 52 to consider Cultural Native American Tribe impacts, the Cultural Resources portion of the NOP/IS checklist has been repeated in this PEA. The updates are included as underlined text. However, even with the additional information, the overall conclusion of "No Impact" for this topic area remains unchanged.

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource, site, or feature?	☐	☐	☐	☑
d)	Disturb any human remains, including those interred outside formal cemeteries?	☐	☐	☐	☑
e)	Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code §21074?	☐	☐	☐	☑

Significance Criteria

Impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance, or tribal cultural significance to a community or ethnic or social group or a California Native American tribe.
- Unique paleontological resources or objects with cultural value to a California Native American tribe are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion

V. a) No Impact. There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Since construction-related activities associated with the implementation of the proposed project are expected to be confined within the existing footprint of the affected facilities that have been fully developed and paved, no impacts to historical resources are expected to occur as a result of implementing the proposed project. Accordingly, this impact issue will not be further analyzed in the Draft PEA.

V. b), c), & d) No Impact. Installing or modifying add-on controls and other associated equipment to comply with the proposed project may require disturbance of previously disturbed areas at the affected existing industrial facilities. However, since construction-related activities are expected to be confined within the existing footprint of the affected facilities that have been fully developed and paved, the proposed project is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that these areas are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed. Therefore, the proposed project has no potential to cause a substantial adverse change to a historical or archaeological resource, directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or disturb any human remains, including those interred outside a formal cemeteries. The proposed project is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the District. Accordingly, these impact issues will not be further analyzed in the Draft PEA.

<u>**V. e) No Impact.** The proposed project is not expected to require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. Furthermore, the proposed project is not expected to result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources. For these reasons, the proposed project is not expected to cause any substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code §21074.</u>

<u>It is important to note that as part of releasing this CEQA document for public review and comment, the SCAQMD also provided a formal notice of the proposed project to all California Native American Tribes (Tribes) that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code §21080.3.1 (b)(1). The NAHC notification list provides a 30-day period during which a Tribe may respond to the formal notice, in writing, requesting consultation on the proposed project.</u>

<u>In the event that a Tribe submits a written request for consultation during this 30-day period, the SCAQMD will initiate a consultation with the Tribe within 30 days of receiving the request in accordance with Public Resources Code §21080.3.1 (b). Consultation ends when either: 1) both parties agree to measures to avoid or mitigate a significant effect on a Tribal Cultural Resource and agreed upon mitigation measures shall be recommended for inclusion in the environmental document [see Public Resources Code §21082.3 (a)]; or, 2) either party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached [see Public Resources Code §21080.3.2 (b)(1)-(2) and §21080.3.1 (b)(1)].</u>

Based upon these considerations, significant cultural resources impacts are not expected from implementing the proposed project, and thus, this topic was not further analyzed in the Draft PEA. Since no significant cultural resources impacts were identified for any of the issues, no mitigation measures are necessary or required.

Geology and Soils

Since the proposed project would result in construction activities at existing RECLAIM facilities located in developed industrial settings to install or modify NOx control equipment, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. Southern California is an area of known seismic activity. Accordingly, the installation of add-on controls at existing affected facilities to comply with the proposed project is expected to conform to the Uniform Building Code and all other applicable state and local building codes. As part of the issuance of building permits, local jurisdictions are responsible for assuring that the Uniform Building Code is adhered to and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation condition at the site. The Uniform Building Code requirements also consider liquefaction potential and establish stringent requirements for building foundations in areas potentially subject to liquefaction. Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated.

Since add-on controls will likely be installed at existing developed facilities, during construction of the proposed project, a slight possibility exists for temporary erosion resulting from excavating and grading activities, if required. These activities are expected to be minor since the existing facilities are generally flat and have previously been graded and paved. Further, wind erosion is not expected to occur to any appreciable extent, because operators at dust generating sites would be required to comply with the best available control measure (BACM) requirements of SCAQMD Rule 403 – Fugitive Dust. In general, operators must control fugitive dust through a number of soil stabilizing measures such as watering the site, using chemical soil stabilizers, revegetating inactive sites, etc. The proposed project involves the installation or modification of add-on control equipment at existing facilities, so that grading could be required to provide stable foundations. Potential air quality impacts related to grading are addressed elsewhere in this Initial Study (as part of construction air quality impacts). No unstable earth conditions or changes in geologic substructures are expected to result from implementing the proposed project.

Since the proposed project will affect existing facilities, it is expected that the soil types present at the affected facilities will not be made further susceptible to expansion or liquefaction. Furthermore, subsidence is not anticipated to be a problem since only minor excavation, grading, or filling activities are expected occur at affected facilities. Additionally, the affected areas are not envisioned to be prone to new landslide impacts or have unique geologic features since the affected equipment units are located at existing facilities in industrial areas.

Since the proposed project will affect equipment units at existing facilities located in industrial zones, it is expected that people or property will not be exposed to new impacts related to expansive soils or soils incapable of supporting water disposal. Further, typically each affected facility has some degree of existing wastewater treatment systems that will continue to be used and are expected to be unaffected by the proposed project. Sewer systems are available to handle wastewater produced and treated by each affected facility. Each existing facility affected by the proposed project does not require installation of septic tanks or alternative wastewater disposal systems. As a result, the proposed project will not require facility operators to utilize septic systems or alternative wastewater disposal systems. Thus, implementation of the proposed project will not adversely affect soils associated with a septic system or alternative wastewater disposal system.

Based upon these considerations, significant geology and soils impacts are not expected from the implementation of the proposed project, and thus, this topic was not further analyzed in the Draft PEA. Since no significant geology and soils impacts were identified for any of the issues, no mitigation measures are necessary or required.

Land Use and Planning

The proposed project does not require the construction of new facilities, but any physical effects that will result from the proposed project, will occur at existing RECLAIM facilities located in heavy industrial areas and would not be expected to go beyond existing boundaries. Thus, implementing the proposed project will not result in physically dividing any established communities.

Further, there are no provisions in the proposed project that would affect land use plans, policies, or regulations. 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. Further, the proposed project would be consistent with the typical industrial zoning of the affected facilities. Typically, all proposed construction activities are expected to occur within the confines of the existing facilities. The proposed project would not affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities. Finally, no new development or alterations to existing land designations will occur as a result of the implementation of the proposed project. Therefore, present or planned land uses in the region will not be affected as a result of implementing the proposed project.

Based upon these considerations, significant land use planning impacts are not expected from the implementation of the proposed project, and thus, will not be further analyzed in the Draft PEA. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

Mineral Resources

There are no provisions in the proposed project that would 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, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Based upon these considerations, significant mineral resource impacts are not expected from the implementation of the proposed project, and thus, will not be further analyzed in the

Draft PEA. Since no significant mineral resource impacts were identified for any of these issues, no mitigation measures are necessary or required.

Noise

Modifications or changes associated with the implementation of the proposed project will take place at existing RECLAIM facilities that are typically located in heavy industrial settings. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. Construction activities associated with implementing the proposed project may generate some noise associated with the use of construction equipment and construction-related traffic. However, noise from the proposed project is not expected to produce noise in excess of current operations at each of the existing facilities. If NOx control devices are installed or existing devices are modified, the operations phase of the proposed project may add new sources of noise to each affected facility. However, control devices are not typically equipment that generate substantial amounts of noise. Nonetheless, for any noise that may be generated by the control devices, it is expected that each facility affected will comply with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. These potential noise increases are expected within the allowable noise levels established by the local noise ordinances for industrial areas, and thus are expected to be less than significant. Therefore, less than significant noise impacts are expected to result from the operation of the proposed project.

Though some of the facilities affected by the proposed project are located at sites within an airport land use plan, or within two miles of a public airport, the addition of new or modification of existing NOx control equipment would not expose people residing or working in the project area to the same degree of excessive noise levels associated with airplanes. All noise producing equipment must comply with local noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. Therefore, less than significant noise impacts are expected to occur at sites located within an airport land use plan, or within two miles of a public airport.

Based upon these considerations, significant noise impacts are not expected from the implementation of the proposed project and will not be further analyzed in the Draft PEA. Further, since no significant impacts were identified for any of these issues, no mitigation measures are necessary or required.

Population and Housing

The construction activities associated with the proposed project at each affected facility are not expected to involve the relocation of individuals, require new housing or commercial facilities, or change the distribution of the population. The reason for this conclusion is that operators of affected facilities who need to perform any construction activities to comply with the proposed project can draw from the large existing labor pool in the local southern California area. Further, it is not expected that the installation of new or the modification of existing NOx control equipment will require new employees during operation of the equipment. In the event that new employees are hired, it is expected that the number of new employees at any one facility would be small. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing the proposed project. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth in the district or population distribution.

Because the proposed project includes modifications and/or changes at existing facilities located in heavy industrial settings, the proposed project is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the district.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project, and thus, will not be further evaluated in the Draft PEA. Since no significant population and housing impacts were identified for any of these issues, no mitigation measures are necessary or required.

Public Services

Implementation of the proposed project is expected to cause facility operators to install new or modify existing NOx control devices, all the while continuing current operations at existing affected facilities. The proposed project may result in a greater demand for catalyst, scrubbing agents and other chemicals, which will need to be transported to the affected facilities to support the function of NOx control equipment and stored onsite prior to use. As first responders to emergency situations, police and fire departments may assist local hazmat teams with containing hazardous materials, putting out fires, and controlling crowds to reduce public exposure to releases of hazardous materials. In addition, emergency or rescue vehicles operated by local, state, and federal law enforcement agencies, police and sheriff departments, fire departments, hospitals, medical or paramedic facilities, that are 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, may be needed in the event of an accidental release or other emergency. While the specific nature or degree of such impacts is currently unknown, the affected facilities have existing emergency response plans so any changes to those plans would not be expected to dramatically alter how emergency personnel would respond to an accidental release or other emergency. In addition, due the low probability and unpredictable nature of accidental releases, the proposed project is not expected to increase the need or demand for additional public services (e.g., fire and police departments and related emergency services, et cetera) above current levels.

As noted in the previous “Population and Housing” discussion, the proposed project is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at affected facilities and operation of new or modified NOx control equipment is not expected to require additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

The proposed project is expected to result in the use of new or modified add-on control equipment for NOx control. Besides permitting the equipment or altering permit conditions by the SCAQMD, there is no need for other types of government services. The proposed project 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. There will be no increase in population and, therefore, no need for physically altered government facilities.

Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed project and will not be further evaluated in the Draft PEA. Since no significant public services impacts were identified for any of these issues, no mitigation measures are necessary or required.

Recreation

As discussed earlier under the topic of "Population and Housing," there are no provisions in the proposed project that would affect or increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities that might have an adverse physical effects on the environment because the proposed project will not directly or indirectly increase or redistribute population. Based upon these considerations, including the conclusion of "no impact" for the topic of "Population and Housing," significant recreation impacts are not expected from implementing the proposed project, and thus, this topic was not further analyzed in the Draft PEA. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

4.8.2 Significant Environmental Effects Which Cannot Be Avoided

CEQA Guidelines §15126 (c) requires an environmental analysis to consider "any significant irreversible environmental changes which would be involved if the proposed action should be implemented." This PEA identified the topics of air quality and GHGs and water demand (under the topic of hydrology and water quality) as the environmental topic areas potentially adversely affected by the proposed project. The NOP/IS also identified the topics of aesthetics, energy, hazards and hazardous materials, solid and hazardous waste, and transportation and traffic as having potentially significant adverse impacts, but after further analysis, these topics were determined to have less than significant impacts. Significant adverse impacts from GHGs generated from both construction and operation activities may be considered irreversible. Facility operators that install new NOx controls or modify existing units are likely to operate these systems for the lifetime of the equipment.

4.8.3 Potential Growth-Inducing Impacts

CEQA Guidelines §15126 (d) requires an environmental analysis to consider the "growth-inducing impact of the proposed action." 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.

4.8.3.1 Economic and Population Growth, and Related Public Services

A project would be considered to 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 proposed project would not remove barriers to population growth, as it involves no changes to a General Plan, zoning ordinance, or a related land use policy.

Further, the proposed project 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 proposed project may indirectly increase the efficiency of the region's urban form through encouraging more air quality efficient development patterns in the form of NOx reductions. The proposed project 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 and Safety Code §40414). Therefore, the proposed project would not directly trigger new residential development in the area.

The proposed project may result in construction activities associated with installing new or modifying existing air pollution control equipment to achieve NOx reductions. However, the proposed project 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 labor force of about 8.5 million in the region and current unemployment rate of about six percent, 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 proposed project as construction activities would be spread over a period from 2015 to 2022[1]. Further, the proposed project 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 proposed project would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

Thus, implementing the proposed project will not, by itself, have any direct or indirect growth-inducing impacts on businesses in the SCAQMD's jurisdiction because it is not expected to foster economic or population growth or the construction of additional housing and primarily affects existing facilities.

4.8.3.2 Removal of Obstacles to Growth

The facilities that may be affected by the proposed project are located within an existing urbanized area. 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 proposed project would require additional energy (electricity, diesel, gasoline, and natural gas) to implement but the increased energy requirements are expected to be within those projected for existing population growth of the region. While construction and operation activities that may occur as a result of the proposed project will require trips associated with construction workers, delivery of supplies and haul trips, the analysis in Subchapter 4.7 for Transportation and Traffic concluded that the trips will occur via existing roadways and transportation corridors. Thus, the proposed project is 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.

4.8.3.3 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 the associated trips would occur along existing 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. Therefore, the proposed project would not result in development within or encroachment into an open space area.

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[1] EDD, Labor Market Information Division, California Labor Market Current Status, May/June 2015. http://www.labormarketinfo.edd.ca.gov/county/sbern.html#URLF

4.8.3.4 Precedent Setting Action

Under the NOx RECLAIM program, a BARCT reassessment is required by the California Health and Safety Code §§40440 and 39616 and is needed to capture the advancement in control technology to assure that NOx RECLAIM facilities would achieve emission reductions as expeditiously as possible. In addition, the SCAQMD developed and adopted the 2012 AQMP which established a plan to meet and maintain the state and federal air quality standards. The 2012 AQMP identifies control measures needed to attain the federal 24-hour standard for PM2.5 by 2014 and provides updates on progress towards meeting the 8-hour ozone standard in 2024. In particular, Control Measure CMB-01 is one of the control measures addressed in the 2012 AQMP. This Control Measure reiterates the requirement for a BARCT reassessment for NOx RECLAIM facilities. Finally, since NOx is a precursor of ozone, reducing NOx as a result of implementing the proposed project will help the basin attain the National Ambient Air Quality Standards (NAAQS) for ozone in 2024 and 2032. Therefore, the proposed project is being prepared to comply with state and federal air quality planning regulations and requirements. This project would not result in precedent-setting actions that might cause other significant environmental impacts (other than those evaluated in other sections of this PEA).

4.8.3.5 Conclusion

The proposed project was developed to comply with local, state and federal air quality planning requirements and 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. While the proposed project could result in construction projects at existing stationary sources, 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.

4.8.4 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 proposed project is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the proposed project is to achieve NOx reductions via a BARCT reassessment of NOx RECLAIM facilities in order to achieve emission reductions as expeditiously as possible and comply with local, state and federal air quality planning requirements. By achieving additional reductions in NOx, an ozone and PM2.5 precursor, the proposed project will help attain federal and state air quality standards which are expected to enhance short and long-term environmental productivity in the region.

Implementing the proposed project 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 and GHG impacts associated with construction and operation activities and water demand (under the topic of hydrology and water quality) are considered potentially significant. Implementation of the recommended mitigation measures will ensure such impacts are mitigated to the greatest degree feasible.

CHAPTER 5

ALTERNATIVES

Introduction

Methodology for Developing Project Alternatives

Description of Alternatives to the Proposed Project

Alternatives Analysis

Comparison of the Alternatives to the Proposed Project

Alternatives Rejected as Infeasible

Lowest Toxic and Environmentally Superior Alternative

Conclusion

5.0 INTRODUCTION

This Draft PEA 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 a means for evaluating the comparative merits of each alternative (CEQA Guidelines §15126.6 (a)). A "No Project" alternative must also be evaluated. 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. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. SCAQMD Rule 110 (the rule which implements the SCAQMD's certified regulatory program) does not impose any greater requirements for a discussion of project alternatives in a program environmental assessment than is required for an EIR under CEQA.

5.1 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.

Alternatives to the proposed project were crafted by varying how the NOx RTC shave would be applied to the NOx RECLAIM facilities and RTC investors. The initial analysis of the proposed project in the NOP/IS determined that, of the amendments proposed, only the components that pertain to the lowered BARCT NOx emission factors could entail physical modifications to the affected equipment and that these physical modifications could create potential adverse significant impacts. As such, in addition to the no project alternative, three alternatives were developed by identifying and modifying major components of the proposed project. Specifically, the primary components of the proposed alternatives that have been modified are the source categories that may be affected, and the manner in which compliance with the proposed lowered BARCT NOx emission factors may be achieved. In addition, in response to comments made by industry, a fifth alternative, with parameters suggested by industry, is also included.

Typically, the existing setting is established at the time the NOP/IS is circulated for public review, which was December 2014. This baseline is used for all environmental topics analyzed in this Draft PEA. 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." As explained in Chapter 2, the baseline for the CPCC facility changed subsequent to when the NOP/IS was circulated for public review such that the installation of control technology and the secondary adverse environmental impacts that may be associated with such control technology is no longer a reasonably foreseeable consequence for CPCC under the present circumstances. Thus, this PEA does not contain an environmental analysis of the control technologies that were originally contemplated in the NOP/IS as BARCT for the CPCC facility. In addition, none of the alternatives described in the chapter contain an environmental analysis of the control technologies specific to the Portland Cement Kilns or the CPCC facility[1].

5.2 DESCRIPTION OF ALTERNATIVES

Five alternatives to the proposed project are summarized in Table 5-1: Alternative 1 (Across the Board), Alternative 2 (Most Stringent), Alternative 3 (Industry Approach), Alternative 4 (No Project), and Alternative 5 (Weighted by BARCT Reduction Contribution for all facilities and investors). The primary components of the proposed alternatives that have been modified are the source categories that may be affected, and the manner in which compliance with the proposed NOx BARCT emission limits may be achieved. Unless otherwise specifically noted, all other components of the project alternatives are identical to the components of the proposed project.

The following subsections provide a brief description of the alternatives.

5.2.1 Alternative 1 – Across the Board Shave of NOx RTCs

Alternative 1 consists of an across the board NOx RTC reduction (shave) of 14 tpd that would affect all NOx RECLAIM facilities and investors. Under Alternative 1, the NOx RTC holdings would be shaved by 53 percent overall. After BARCT is applied, 8.79 tpd of actual NOx reductions from existing emission levels are projected to occur, with an additional 5.21 tpd of NOx RTCs needed to fulfill the shave, post-BARCT. By applying a shave of 53 percent to all facilities, 210 facilities, which represent the bottom 10 percent of RTC holders, would become potential future buyers of RTCs since the amount of RTC holdings for these facilities would become less than their current actual emissions.

Under Alternative 1, the amount of the proposed NOx RTC shave of 14 tpd is identical to the proposed project. However, the distribution of the shave under Alternative 1 would reduce the NOx RTC holdings differently than the proposed project. Specifically, Alternative 1 would reduce NOx RTC holdings from all 275 NOx RECLAIM facilities and investors by 53 percent overall. The proposed project, however, would reduce NOx RTC holdings by: 1) 67 percent for 9 refineries and investors (treated as one facility); 2) 47 percent for 30 power plants; 3) 47 percent for 26 non-major facilities; and, 4) zero percent for the remaining 210 facilities.

The amount of the shave is based on a recent BARCT analysis. For the refinery sector, a new level of BARCT is proposed for FCCUs, refinery boilers/heaters, refinery gas turbines, coke

[1] Because of CPCC's current permitting status for their Portland cement kilns (e.g., the permits were surrendered), CPCC operators will not be able to retrofit the Portland cement kilns with air pollution control equipment in response to the proposed project without first dealing with the permitting issues for the cement kilns. Thus, the installation of control technology and the secondary adverse environmental impacts that may be associated with such control technology is not a reasonably foreseeable consequence for CPCC under the present circumstances. Further, there are no other facilities in SCAQMD's jurisdiction that operate Portland cement kilns. Thus, this PEA does not contain an environmental analysis of the control technologies that were originally contemplated in the NOP/IS for the CPCC facility.

calciners, and SRU/TGUs. For the non-refinery sector, a new BARCT level is proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal heat treating furnaces, gas turbines and ICEs not located on the outer continental shelf (OCS). No new BARCT is proposed for power plants. In order to achieve these new BARCT levels, the likely possibility is that operators of 20 facilities within the affected source categories will reduce actual NOx emissions via physical modifications to a wide variety of equipment by installing new air pollution control equipment or modifying existing air pollution control equipment. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. In particular, the number and type of control equipment that may be installed as a result of the proposed project and the corresponding adverse impacts that were analyzed for the proposed project, the same control equipment and corresponding adverse impacts will also occur under Alternative 1.

5.2.2 Alternative 2 – Most Stringent Shave of NOx RTCs

Alternative 2 consists of the most stringent approach by applying an across the board NOx RTC shave of 15.87 tpd. Alternative 2 would affect all RECLAIM facilities and investors, but without including the 10 percent compliance margin or the BARCT adjustment for refinery equipment. Under Alternative 2, the NOx RTC holdings would be shaved by 60 percent overall. After BARCT is applied, 8.79 tpd of actual NOx reductions are projected to occur, with 7.08 tpd of NOx RTCs needed to fulfill the shave, post-BARCT. By applying a shave of 60 percent to all facilities, 210 facilities, which represent the bottom 10 percent of RTC holders, would become potential future buyers of RTCs since the amount of RTC holdings for these facilities would become less than their current actual emissions.

Under Alternative 2, the amount of the proposed NOx RTC shave of 15.87 tpd is greater than the 14 tpd NOx RTC shave that is contemplated by the proposed project. In addition, the distribution of the shave under Alternative 2 would reduce the NOx RTC holdings differently than the proposed project. Specifically, Alternative 2 would reduce NOx RTC holdings from all 275 NOx RECLAIM facilities and investors by 60 percent overall. The proposed project, however, would reduce NOx RTC holdings by: 1) 67 percent for 9 refineries and investors (treated as one facility); 2) 47 percent for 30 power plants; 3) 47 percent for 26 non-major facilities; and, 4) zero percent for the remaining 210 facilities.

For the refinery sector, a new level of BARCT is proposed for FCCUs, refinery boilers/heaters, refinery gas turbines, coke calciners, and SRU/TGUs. For the non-refinery sector, a new BARCT level is proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal heat treating furnaces, gas turbines and ICEs not located on the OCS. No new BARCT is proposed for power plants. In order to achieve these new BARCT levels, the likely possibility is that operators of 20 facilities with the affected source categories will reduce actual NOx emissions via physical modifications to a wide variety of equipment by installing new air pollution control equipment or modifying existing air pollution control equipment. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. In particular, the number and type of control equipment that may be installed as a result of the proposed project and the corresponding adverse impacts that were analyzed for the proposed project, the same control equipment and corresponding adverse impacts will also occur under Alternative 2.

It is possible that under Alternative 2, facilities could increase their level of control further than what is analyzed for the proposed project to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with possibly additional adverse environmental impacts. However, it would be speculative to predict how many and what type of additional controls would be proposed in order to obtain a compliance margin. For this reason, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project is speculative and cannot be analyzed.

Thus, analysis of Alternative 2 contains the same number and type of control equipment that may be installed as a result of the proposed project and the same corresponding adverse impacts that were analyzed for the proposed project.

5.2.3 Alternative 3 – Industry Approach

Alternative 3, an approach that has been proposed by industry representatives, consists of an across the board NOx RTC shave of 8.79 tpd from total RTC holdings that would affect all RECLAIM facilities and investors. The calculation under Alternative 3 subtracts the base year emissions at the proposed BARCT level from the base year emissions at the previous BARCT level (Year 2000 or 2005). Under Alternative 3, the NOx RTCs held by all RECLAIM facilities and investors would be shaved by 33 percent overall. Since there are currently more NOx RTCs than actual 2011 emissions, it is likely that much of the 8.79 tons per day reduction in RTCs will occur by surrendering excess RTCs rather than installing additional controls. However, some amount of NOx reductions may need to be obtained by installing NOx controls. It is difficult for staff to predict how much NOx emission reductions would be needed from the installation of controls, but it is likely that substantially fewer controls will be installed (and thus, actual NOx reductions achieved) than under the proposed project. By applying a shave of 33 percent to all facilities, 210 facilities, which represent the bottom 10 percent of RTC holders, would become potential future buyers of RTCs since the amount of RTC holdings for these facilities would become less than their current actual emissions.

Under Alternative 3, the amount of the proposed NOx RTC shave of 8.0 tpd is less than the 14.0 tpd NOx RTC shave that is contemplated by the proposed project. In addition, the distribution of the shave under Alternative 3 would reduce the NOx RTC holdings differently than the proposed project. Specifically, Alternative 3 would reduce NOx RTC holdings from all 275 NOx RECLAIM facilities and investors by 33 percent overall. The proposed project, however, would reduce NOx RTC holdings by: 1) 67 percent for 9 refineries and investors (treated as one facility); 2) 47 percent for 30 power plants; 3) 47 percent for 26 non-major facilities; and, 4) zero percent for the remaining 210 facilities.

For the refinery sector, a new level of BARCT is proposed for FCCUs, refinery boilers/heaters, refinery gas turbines, coke calciners, and SRU/TGUs. For the non-refinery sector, a new BARCT level is proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal heat treating furnaces, gas turbines and ICEs not located on the OCS. No new BARCT is proposed for power plants. In order to achieve these new BARCT levels, the likely possibility is that operators of 20 facilities with the affected source categories will reduce actual NOx emissions via physical modifications to a wide variety of equipment by installing new air pollution control equipment or modifying existing air pollution control equipment. However, because the proposed NOx RTC shave under Alternative 3 is so much less than the proposed project (e.g., 8.0 tpd vs. 14.0 tpd), it is possible that the entire 8.0 tpd NOx RTC shave could be addressed with unused RTCs without having any facilities modifying their equipment to achieve actual NOx reductions from installing air pollution control equipment. Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

5.2.4 Alternative 4 - No Project

Alternative 4 is the "No Project" approach such that no NOx RTC reductions would be applied to any RECLAIM facility or investor. 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 proposed project. The net effect of not amending Regulation XX to reduce the available RTCs on the market would be a continuation of the 2005 amendments to the NOx RECLAIM program. This approach is consistent with CEQA Guidelines §15126.6 (e)(3)(B), which states: "If the project is other than a land use or regulatory plan, for example a development project on identifiable property, the "no project" alternative is the circumstance under which the project does not proceed." The discussion in this PEA would compare the environmental effects of the Regulation XX remaining in its existing state against any environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. In certain instances, the no project alternative means "no build" wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment."

Thus, under Alternative 4, the No Project alternative would not achieve any NOx reductions, no NOx control equipment would be installed and consequently, no environmental impacts from constructing or operating NOx control equipment would occur. However, if Alternative 4 is implemented, the SCAQMD would be required to seek reductions from as yet unidentified other sources with potential but unknowable adverse impacts.

5.2.5 Alternative 5 – Weighted by BARCT Reduction Contribution

Alternative 5 consists of an across the board NOx RTC reduction (shave) of 14 tpd that would affect all NOx RECLAIM facilities and investors. However, the NOx RTC reductions under this alternative would be weighted by the BARCT reduction contribution for major refineries and all other facilities, with investors grouped with the major refineries. As such, NOx RTC holdings for major refineries and investors would be shaved by 67 percent and the NOx RTC holdings for non-major refineries and all other facilities would be shaved by 36 percent. After BARCT is applied, 8.79 tpd of actual NOx reductions are projected to occur, with 5.21 tpd of NOx RTCs needed to fulfill the shave, post-BARCT. By applying a shave of 36 percent to facilities to non-major facilities, power plants, and the bottom 10 percent of RTC holders, 210 facilities, which represent the bottom 10 percent of RTC holders, would become potential future buyers of RTCs since the amount of RTC holdings for these facilities would become less than their current actual emissions.

Under Alternative 5, the amount of the proposed NOx RTC shave of 14 tpd is identical to the proposed project. However, the distribution of the shave under Alternative 5 would reduce the NOx RTC holdings differently than the proposed project. Specifically, Alternative 5 would reduce NOx RTC holdings by: 1) 67 percent for 9 refineries and investors (treated as one facility); 2) 36 percent for 30 power plants; 3) 36 percent for 26 non-major facilities; and, 4) 36 percent for the remaining 210 facilities. The proposed project, however, would reduce NOx RTC holdings by: 1) 67 percent for 9 refineries and investors (treated as one facility); 2) 47 percent for 30 power plants; 3) 47 percent for 26 non-major facilities; and, 4) zero percent for the remaining 210 facilities.

For the refinery sector, a new level of BARCT is proposed for FCCUs, refinery boilers/heaters, refinery gas turbines, coke calciners, and SRU/TGUs. For the non-refinery sector, a new BARCT level is proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal heat treating furnaces, gas turbines and ICEs not located on the OCS. No new BARCT is proposed for power plants. In order to achieve these new BARCT levels, the likely possibility is that operators of 20 facilities with the affected source categories will reduce actual NOx emissions via physical modifications to a wide variety of equipment by installing new air pollution control equipment or modifying existing air pollution control equipment. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. In particular to the number and type of control equipment that may be installed as a result of the proposed project and the corresponding adverse impacts that were analyzed for the proposed project, the same control equipment and corresponding adverse impacts will also occur under Alternative 5.

Table 5-1
Summary of Proposed Project & Alternatives

Components of Proposed Project		Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	NOx Reduction Potential *(tons/day)*	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	NOx Reduction Potential *(tons/day)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	NOx Reduction Potential *(tons/day)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	NOx Reduction Potential *(tons/day)*
Proposed NOx RTC "Shave"			**14.00**		**14.00**		**15.87**		**8.00**
Basic Equipment	**BARCT**								
FCCU	SCR or LoTOx™ with WGS	2 ppmv NOx at 3% O2	0.43	Same as proposed project	0.43	Same as proposed project	0.43	Same as proposed project	0.43
Refinery Boilers/ Heaters	SCR	2 ppmv NOx, or 0.002 lb NOx/mmBTU	0.96	Same as proposed project	0.96	Same as proposed project	0.96	Same as proposed project	0.96
Refinery Gas Turbines	SCR or SCR Catalyst	2 ppmv NOx at 15% O2	4.14	Same as proposed project	4.14	Same as proposed project	4.14	Same as proposed project	4.14
SRU/TGU	LoTOx™ with WGS or SCR	2 ppmv NOx at 3% O2, or 95% reduction	0.32	Same as proposed project	0.32	Same as proposed project	0.32	Same as proposed project	0.32
Coke Calciner	LoTOx™ with WGS or Ultracat DGS	10 ppmv at 3% O2	0.17	Same as proposed project	0.17	Same as proposed project	0.17	Same as proposed project	0.17
Glass Melting Furnace	SCR or Ultracat DGS	80% reduction, or 0.024 lb NOx per ton glass produced	0.24	Same as proposed project	0.24	Same as proposed project	0.24	Same as proposed project	0.24
Sodium Silicate Furnace	SCR or Ultracat DGS (without dry sorbent)	80% reduction, or 1.28 lb NOx per ton of glass pulled	0.09	Same as proposed project	0.09	Same as proposed project	0.09	Same as proposed project	0.09
Metal Heat Treating Furnace	SCR	9 ppmv at 3% O2, or 0.011 lb NOx/mmBTU	0.56	Same as proposed project	0.56	Same as proposed project	0.56	Same as proposed project	0.56
ICEs (Non-Refinery/Non-Power Plant)	SCR	11 ppmv NOx at 15% O2, 0.041 lb NOx/mmBTU, or 43.05 lb NOx/MMcf	0.84	Same as proposed project	0.84	Same as proposed project	0.84	Same as proposed project	0.84
Gas Turbines (Non-Refinery/ Non-Power Plant)	SCR	2 ppmv NOx at 15% O2	1.04	Same as proposed project	1.04	Same as proposed project	1.04	Same as proposed project	1.04
Potential NOx Emission Reductions (BARCT)			**8.79**		**8.79**		**8.79**		**8.79**
NOx RTCs Needed to Fulfill Shave Post-BARCT			**5.21**		**5.21**		**7.08**		**0**

Key: SCR = Selective Catalytic Reduction; WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber
ppmv = parts per million by volume; mmBTU = million British Thermal Units; MMcf = million cubic feet

Table 5-1 (concluded)

Summary of Proposed Project & Alternatives

Components of Proposed Project		**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**NOx Reduction Potential** *(tons/day)*	**Alternative 4: No Project**	**NOx Reduction Potential** *(tons/day)*	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**	**NOx Reduction Potential** *(tons/day)*
Proposed NOx RTC "Shave"			**14.00**		**0**		**14.00**
Basic Equipment	**BARCT**						
FCCU	SCR or LoTOx^{TM} with WGS	2 ppmv NOx at 3% O2	0.43	No NOx limit	0	Same as proposed project	0.43
Refinery Boilers/ Heaters	SCR	2 ppmv NOx, or 0.002 lb NOx/mmBTU	0.96	No NOx limit	0	Same as proposed project	0.96
Refinery Gas Turbines	SCR or SCR Catalyst	2 ppmv NOx at 15% O2	4.14	No NOx limit	0	Same as proposed project	4.14
SRU/TGU	LoTOx^{TM} with WGS	2 ppmv NOx at 3% O2, or 95% reduction	0.32	No NOx limit	0	Same as proposed project	0.32
Coke Calciner	LoTOx^{TM} with WGS or Ultracat DGS	10 ppmv at 3% O2	0.17	No NOx limit	0	Same as proposed project	0.17
Glass Melting Furnace	SCR or Ultracat DGS	80% reduction, or 0.024 lb NOx per ton glass produced	0.24	No NOx limit	0	Same as proposed project	0.24
Sodium Silicate Furnace	SCR or Ultracat DGS (without dry sorbent)	80% reduction, or 1.28 lb NOx per ton of glass pulled	0.09	No NOx limit	0	Same as proposed project	0.09
Metal Heat Treating Furnace	SCR	9 ppmv at 3% O2, or 0.011 lb NOx/mmBTU	0.56	No NOx limit	0	Same as proposed project	0.56
ICEs (Non-Refinery/Non-Power Plant)	SCR	11 ppmv NOx at 15% O2, 0.041 lb NOx/mmBTU, or 43.05 lb NOx/MMcf	0.84	No NOx limit	0	Same as proposed project	0.84
Gas Turbines (Non-Refinery/ Non-Power Plant)	SCR	2 ppmv NOx at 15% O2	1.04	No NOx limit	0	Same as proposed project	1.04
Potential NOx Emission Reductions			**8.79**		**0**		8.79
NOx RTCs Needed to Fulfill Shave Post-BARCT			**5.21**		**0**		**5.21**

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber

Key: SCR = Selective Catalytic Reduction; WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber

ppmv = parts per million by volume; mmBTU = million British Thermal Units; MMcf = million cubic feet

5.3 ALTERNATIVES ANALYSIS

The following subsections include the same environmental topic areas evaluated for the proposed project. Under each environmental topic area, impacts and significance conclusions are summarized for the proposed project. 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.

5.3.1 Aesthetics

The potential aesthetics impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of aesthetics impacts from each alternative relative to the proposed project.

5.3.1.1 Proposed Project

Potential direct and indirect aesthetics impacts from the proposed project are summarized in the following subsection. For the complete analysis, refer to Subchapter 4.1 – Aesthetics.

Physical modifications may result as part of implementing the proposed project and will vary depending on the equipment source category/process. The aesthetics analysis in this CEQA document is based on the assumption that new air pollution control equipment is expected to be installed and existing air pollution control equipment is expected to be modified as part of implementing the proposed project. Aesthetic impacts associated with the installation of new or the modification of existing NOx control, were identified in the NOP/IS to be potentially significant and, as such, are evaluated in this PEA.

Implementation of the proposed project is expected to result in construction activities at some or all of the affected facilities, which are complex industrial facilities. Due to the large size profiles of the affected equipment, the construction activities associated with installing control equipment are expected to require the use of heavy-duty construction equipment, such as cranes, which may temporarily change the skyline of the affected facilities, depending on where they are located within each facility's property. However, because each affected facility is located in a heavy industrial area, the construction equipment is not expected to be substantially discernable from what would be needed for routine operations and maintenance activities. For these reasons, the construction activities are expected to blend in with the existing industrial environment and thus, are not expected to affect the visual continuity of the surrounding areas.

In addition, for any installation of a WGS, operational aesthetic impacts resulting from a substantial visible steam (water vapor) plume that would emanate from the WGS stack were evaluated in this PEA. The analysis will show that if any WGS is installed as part of the proposed project at any of the affected facilities, the steam plume, though visible, is not expected to significantly adversely affect the visual continuity of the surrounding area of each affected facility because no scenic highways or corridors exist within the areas of the refineries, the coke calciner, the sulfuric acid plants and the glass melting plant. Further, the visual continuity of the surrounding area is not expected to be adversely impacted because each WGS, if constructed, will be built within the confines of industrial areas and would be visually consistent with the profiles of the existing affected facilities. Thus, even if each WGS could be visible, depending on the location within each property boundary, the aesthetic significance criteria would not be exceeded. For these reasons, less than significant aesthetics impacts during operation are expected from the proposed project.

Overall, the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project.

5.3.1.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. Thus, since the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project, the aesthetics impacts were determined to be less than significant during both construction and operation under Alternative 1.

5.3.1.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with greater adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

Thus, analysis of Alternative 2 contains the same number and type of control equipment that may be installed as a result of the proposed project and the same corresponding adverse impacts that were analyzed for the proposed project

Thus, since the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project, the aesthetics impacts were determined to be less than significant during both construction and operation under Alternative 2.

5.3.1.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

Thus, since the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project, the aesthetics impacts were determined to be less than significant during both construction and operation under Alternative 3.

5.3.1.5 Alternative 4 – No Project

Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of aesthetics would be expected. Thus, no significant impacts to aesthetics resources would be expected to occur under Alternative 4.

5.3.1.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. Thus, since the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project, the aesthetics impacts were determined to be less than significant during both construction and operation under Alternative 5.

5.3.2 Air Quality and GHG Emissions

The potential direct and indirect air quality and GHG emissions impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect air quality and GHG emissions impacts from each alternative relative to the proposed project.

5.3.2.1 Proposed Project

Potential direct and indirect air quality and GHG emissions impacts from the proposed project are summarized in the following subsection. For the complete analysis, refer to Subchapter 4.2 - Air Quality and Greenhouse Gases.

The proposed project is expected to result in a total of 14 tpd of NOx RTC reductions from the current RTC holdings of 26.5 tpd, to be implemented over a seven-year period from 2016 to 2022. For the 275 facilities that are in the NOx RECLAIM program, the 14 tpd of NOx RTC reductions will only affect 65 facilities plus the investors that, together, hold 90 percent of the NOx RTC holdings. Investors are included in the refinery sector and treated as one facility. For the remaining 210 facilities that hold 10 percent of the 26.5 tpd of the NOx RTCs, no NOx RTC shave is proposed because no new BARCT (not cost effective and/or infeasible) was identified for the types of equipment and source categories at these facilities. By following this approach, the shave of NOx RTC holdings is distributed as follows:

- 67% shave for 9 refineries and investors (treated as one facility)
- 47% shave for 30 power plants
- 47% shave for 26 non-major facilities
- 0% shave for 210 remaining facilities

SCAQMD staff has conducted a BARCT analysis for all 275 facilities and of these, 30 power producing facilities where shown to operate at current BARCT or BACT levels. For 224 facilities, either no new BARCT was identified or the installation of control equipment was determined to not be cost-effective. Further, only 44 facilities are expected to comply with the proposed NOx RTC shave through the purchase of RTCs which will have no environmental impact.

To reduce NOx from the remaining 21 facilities (e.g., 275 – 30 power producers – 224 = 21) which are either major or large sources of NOx for which new BARCT has been identified, the BARCT analysis found that it would be both feasible and cost-effective for facility operators to install new control equipment or modify existing control equipment at 20 facilities with 11 facilities belonging to the non-refinery sector and 9 facilities belonging to the refinery sector[2].

As a result, operators of these 20 facilities may choose to modify existing equipment by retrofitting with air pollution control technologies in order to comply with the shave of NOx RTCs. The physical changes involved that may occur as a result of implementing the proposed project focus on the installation of new or the modification of existing control equipment on the following types of equipment and processes: 1) fluid catalytic cracking units; 2) refinery boilers and heaters; 3) refinery gas turbines; 4) sulfur recovery units – tail gas treatment units; 5) non-refinery/non-power plant gas turbines; 6) non-refinery sodium silicate furnaces; 7) non-refinery/non-power plant internal combustion engines; 8) container glass melting furnaces; 9) coke calcining; and, 10) metal heat treating furnaces. Table 1-2 summarizes the potential NOx control technologies that may be considered as part of implementing the proposed project.

Table 5-2
Potential NOx Control Devices Per Sector and Equipment/Source Category

Sector	Equipment/Source Category	Potential NOx Control Devices
Refinery	Fluid Catalytic Cracking Units (FCCUs)	SCR LoTOx™ with WGS LoTOx™ without WGS
Refinery	Refinery Process Heaters and Boilers	SCR
Refinery	Refinery Gas Turbines	SCR
Refinery	Sulfur Recovery Unit / Tail Gas Units (SRU/TGUs)	LoTOx™ with WGSs SCR
Refinery	Petroleum Coke Calciner	LoTOx™ with WGS UltraCat with DGS
Non-Refinery	Container Glass Melting Furnaces	SCR UltraCat with DGS
Non-Refinery	Sodium Silicate Furnaces	SCR UltraCat with DGS
Non-Refinery	Metal Heat Treating Furnaces	SCR
Non-Refinery	Internal Combustion Engines (Non-Refinery/Non-Power Plant)	SCR
Non-Refinery	Turbines (Non-Refinery/Non-Power Plant)	SCRs

Construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts. In addition, operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies and the removal of waste from the control processes for disposal or recycling are also expected and have the potential to generate significant adverse air quality impacts for greenhouse gases (GHGs).

[2] Since one facility is no longer operating, the analysis is based on 20 facilities, instead of 21 facilities.

With regard to GHG emissions, the proposed project involves combustion processes which could generate GHG emissions such as CO2, CH4, and N2O. However, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs. Implementing the proposed project is expected to increase GHG emissions that exceed the SCAQMD's GHG significance threshold for industrial sources. In addition, implementing the proposed project is expected to generate significant adverse cumulative GHG air quality impacts.

5.3.2.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

The analysis of the proposed project concluded that construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts. In addition, the analysis of the proposed project concluded that operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies and the removal of waste from the control processes for disposal or recycling are also expected and have the potential to generate significant adverse air quality impacts for greenhouse gases (GHGs).

Thus, since the air quality impacts during construction were determined to be significant for the proposed project, the air quality impacts during construction were determined to be significant under Alternative 1. Similarly, since the GHG impacts were determined to be significant for the proposed project, the GHG impacts were also determined to be significant under Alternative 1.

5.3.2.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with fewer adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

The analysis of the proposed project concluded that construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts. In addition, the analysis of the proposed project concluded that operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies and the removal of waste from the control processes for disposal or recycling are also expected and have the potential to generate significant adverse air quality impacts for GHGs.

Thus, since the air quality impacts during construction were determined to be significant for the proposed project, the air quality impacts during construction were determined to be significant under Alternative 2. Similarly, since the GHG impacts were determined to be significant for the proposed project, the GHG impacts were also determined to be significant under Alternative 2.

5.3.2.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

The analysis of the proposed project concluded that construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts. In addition, the analysis of the proposed project concluded that operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies and the removal of waste from the control processes for disposal or recycling are also expected and have the potential to generate significant adverse air quality impacts for GHGs.

Thus, since the air quality impacts during construction were determined to be significant for the proposed project, the air quality impacts during construction were determined to be significant under Alternative 3. Similarly, since the GHG impacts were determined to be significant for the proposed project, the GHG impacts were also determined to be significant under Alternative 3.

5.3.2.5 Alternative 4 – No Project

Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of air quality and GHGs would be expected. However, because Alternative 4 is the continued implementation of the 2005 amendments to the NOx RECLAIM program, no additional NOx emissions would occur even SCAQMD is required to conduct a BARCT assessment in accordance with Health and Safety Code §§40440 and 39616 that demonstrates achievable NOx emission reductions. Thus, without any additional NOx reductions, no benefits to air quality and GHG emissions would occur.. Although there are other existing rules that may have future compliance dates for NOx emission reductions, potential adverse impacts from these rules have already been evaluated in the Final Program EIR for the 2012 AQMP and their subsequent rule-specific CEQA documents. While air quality would continue to improve to a certain extent, 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.

5.3.2.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

The analysis of the proposed project concluded that construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts. In addition, the analysis of the proposed project concluded that operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies and the removal of waste from the control processes for disposal or recycling are also expected and have the potential to generate significant adverse air quality impacts for GHGs.

Thus, since the air quality impacts during construction were determined to be significant for the proposed project, the air quality impacts during construction were determined to be significant under Alternative 5. Similarly, since the GHG impacts were determined to be significant for the proposed project, the GHG impacts were also determined to be significant under Alternative 5.

5.3.3 Energy

The potential energy impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of the energy impacts from each alternative relative to the proposed project.

5.3.3.1 Proposed Project

Potential direct and indirect energy impacts from the proposed project are summarized in the following subsection. For the complete analysis, refer to Subchapter 4.3 - Energy.

During installation or modification of add-on air pollution control devices, adverse energy impacts (e.g., increased demand in energy) may occur during construction due to the need for: 1) diesel fuel to operate onsite construction equipment that cannot utilize or access electricity; 2) diesel fuel to operate heavy-duty and medium-duty vehicles for delivering supplies and hauling waste during construction; and, 3) gasoline to operate offsite vehicles used for worker commuting. The analysis of the proposed project concluded that these projected increased usages of diesel fuel and gasoline would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, these projected increased usages of diesel fuel and gasoline would not create any significant effects on peak and base period demands on the availability of diesel fuel and gasoline.

After the add-on air pollution control devices are installed and operating, adverse energy impacts (e.g., increased demand in energy) may occur during operation due to the need for: 1) electricity to operate the air pollution control devices; and, 2) diesel fuel to operate heavy-duty and medium-duty vehicles for delivering supplies and hauling waste during operation. The analysis of the proposed project concluded that the increased use of electricity and diesel fuel during operation would not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for electricity usage, implementation of the proposed project is expected to have less than significant energy impacts during operation.

5.3.3.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

The analysis of the proposed project concluded that there would be increased usages of diesel fuel and gasoline and these projected increases would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, these projected increased usages of diesel fuel and gasoline during construction would not create any significant effects on peak and base period demands on the availability of diesel fuel and gasoline. In addition, the analysis of the proposed project concluded that the increased use of electricity and diesel fuel during operation would also not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for electricity usage, implementation of the proposed project is expected to have less than significant energy impacts during operation.

Thus, since the energy impacts during construction and operation were determined to be less than significant for the proposed project, the air quality impacts during construction and operation were also determined to be less than significant under Alternative 1.

5.3.3.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with fewer adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

The analysis of the proposed project concluded that there would be increased usages of diesel fuel and gasoline and these projected increases would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, these projected increased usages of diesel fuel and gasoline during construction would not create any significant effects on peak and base period demands on the availability of diesel fuel and gasoline. In addition, the analysis of the proposed project concluded that the increased use of electricity and diesel fuel during operation would also not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for electricity usage, implementation of the proposed project is expected to have less than significant energy impacts during operation.

Thus, since the energy impacts during construction and operation were determined to be less than significant for the proposed project, the air quality impacts during construction and operation were also determined to be less than significant under Alternative 2.

5.3.3.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

The analysis of the proposed project concluded that there would be increased usages of diesel fuel and gasoline and these projected increases would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, these projected increased usages of diesel fuel and gasoline during construction would not create any significant effects on peak and base period demands on the availability of diesel fuel and gasoline. In addition, the analysis of the proposed project concluded that the increased use of electricity and diesel fuel during operation would also not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for electricity usage, implementation of the proposed project is expected to have less than significant energy impacts during operation.

Thus, since the energy impacts during construction and operation were determined to be less than significant for the proposed project, the air quality impacts during construction and operation were also determined to be less than significant under Alternative 3.

5.3.3.5 Alternative 4 – No Project

Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of energy would be expected. Thus, no significant impacts to energy would be expected to occur under Alternative 4.

5.3.3.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

The analysis of the proposed project concluded that there would be increased usages of diesel fuel and gasoline and these projected increases would not create any significant effects on local or regional energy supplies and on requirements for additional energy. Further, these projected increased usages of diesel fuel and gasoline during construction would not create any significant effects on peak and base period demands on the availability of diesel fuel and gasoline. In addition, the analysis of the proposed project concluded that the increased use of electricity and diesel fuel during operation would also not exceed the significance threshold of one percent of supply. Since the proposed project would not exceed the SCAQMD's energy threshold of one percent of supply for electricity usage, implementation of the proposed project is expected to have less than significant energy impacts during operation.

Thus, since the energy impacts during construction and operation were determined to be less than significant for the proposed project, the air quality impacts during construction and operation were also determined to be less than significant under Alternative 5.

5.3.4 Hazards and Hazardous Materials

The potential hazards and hazardous materials impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of hazards and hazardous materials impacts from each alternative relative to the proposed project.

5.3.4.1 Proposed Project

Potential hazards and hazardous materials impacts from the proposed project are summarized in the following subsection. For the complete analysis, refer to Subchapter 4.4 - Hazards and Hazardous Materials.

Several components with regard to reducing NOx emissions by installing new or modifying existing NOx controls as part of implementing the proposed project may affect the use, storage and transport of hazards and hazardous materials during operational-related activities. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing the proposed project. The key effects of implementing the proposed project and the determination of which aspects involve hazards and hazardous materials focus on: 1) the anticipated increase of substances used to operate the new or modified NOx controls; and, 2) the increased capture of hazardous substances as part of the overall NOx reduction effort. The analysis of hazards and hazardous materials impacts concluded that the proposed project is expected to generate less than significant adverse impacts related to any of the hazardous substances, such as ammonia and sodium hydroxide, which may be used to operate NOx control equipment.

5.3.4.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

The analysis of hazards and hazardous materials impacts concluded that the proposed project is expected to generate less than significant adverse impacts related to any of the hazardous substances, such as ammonia and sodium hydroxide, which may be used to operate NOx control equipment.

Thus, since the hazards and hazardous materials impacts were determined to be less than significant for the proposed project, the hazards and hazardous materials impacts were also determined to be less than significant under Alternative 1.

5.3.4.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with fewer adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

The analysis of hazards and hazardous materials impacts concluded that the proposed project is expected to generate less than significant adverse impacts related to any of the hazardous substances, such as ammonia and sodium hydroxide, which may be used to operate NOx control equipment. Thus, since the hazards and hazardous materials impacts were determined to be less than significant for the proposed project, the hazards and hazardous materials impacts were also determined to be less than significant under Alternative 2.

5.3.4.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

The analysis of hazards and hazardous materials impacts concluded that the proposed project is expected to generate less than significant adverse impacts related to any of the hazardous substances, such as ammonia and sodium hydroxide, which may be used to operate NOx control equipment.

Thus, since the hazards and hazardous materials impacts were determined to be less than significant for the proposed project, the hazards and hazardous materials impacts were also determined to be less than significant under Alternative 3.

5.3.4.5 Alternative 4 – No Project

Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of hazards and hazardous materials would be expected. Thus, no significant impacts to hazards and hazardous would be expected to occur under Alternative 4.

5.3.4.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

The analysis of hazards and hazardous materials impacts concluded that the proposed project is expected to generate less than significant adverse impacts related to any of the hazardous substances, such as ammonia and sodium hydroxide, which may be used to operate NOx control equipment.

Thus, since the hazards and hazardous materials impacts were determined to be less than significant for the proposed project, the hazards and hazardous materials impacts were also determined to be less than significant under Alternative 5.

5.3.5 Hydrology and Water Quality

The potential hydrology and water quality impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of the hydrology and water quality impacts from each alternative relative to the proposed project.

5.3.5.1 Proposed Project

Potential hydrology and water quality materials impacts from the proposed project are summarized in the following subsection. For the complete analysis, refer to Subchapter 4.5 - Hydrology and Water Quality.

The proposed project is expected to result in the installation of the following new NOx air pollution control equipment: up to 117 SCRs, eight LoTOx^{TM} with WGSs, one LoTOx^{TM} without WGS, and three UltraCat DGSs. During installation these add-on air pollution control devices, adverse hydrology and water quality impacts may occur during construction due to the need for water for dust suppression. Depending on the proposed location within each facility's boundaries for the siting of any new control equipment that may be installed as a result of implementing the proposed project, construction activities such as digging, earthmoving, grading, slab pouring, or paving could occur if the proposed site for the new equipment is not suitable in its present form (e.g., graded with a foundation slab). However, for the few facility operators that may choose to modify or replace their existing NOx control equipment, site preparation activities are not expected because the existing foundation and the existing equipment are expected to be reused in their current location and current plot space. Therefore, no water for dust suppression purposes is expected to be needed for any construction upgrades to existing NOx control equipment.

The potential increase in water use for the facilities that may need to conduct watering for dust suppression activities is below the SCAQMD's significance thresholds of five million gallons per day of total water (e.g., potable, recycled, and groundwater) and 262,820 gallons per day of potable water. The amount of water that may be used on a daily basis for dust suppression activities during construction is less than significant.

Once constructed, but prior to operation of the new or modified air pollution control equipment, additional water is expected to be used to hydrostatically (pressure) test all storage tanks and pipelines, that are installed as part of support equipment to the air pollution control equipment, to ensure each structure's integrity and wastewater may be created during the testing. Pressure testing is typically a one-time event, unless a leak is found. The potential increase in water use for all 20 facilities conducting hydrotesting activities is estimated to be 353,724 gallons per day, which is less than the SCAQMD's significance thresholds of five million gallons per day of total water but greater than 262,820 gallons per day of potable water. Thus, the amount of water that may be used on a daily basis for hydrotesting activities post-construction but prior to operation is significant.

Any wastewater generated from hydrotesting or pressure testing is expected to flow to each affected facility's wastewater treatment or collection system and recycled or discharged after treatment with process wastewater. Thus, wastewater generation from pressure testing activities is not expected to affect groundwater quality. Further, the volume of wastewater that will be generated from pressure testing is expected to be minimal and within the capacity of each facility's wastewater treatment and collection systems. Also, because the proposed project is expected to disturb substantially less than one acre per facility, on-site collection of storm water in each facility's storm water collection system is expected to be about the same as the amount currently collected. Therefore, no significant impacts are expected from wastewater generation or storm water during construction.

Of the technologies proposed as BARCT for NOx control, only WGSs utilize water and generate wastewater as part of their day-to-day operations. For this reason, only WGS technology was identified as having the potential to generate adverse hydrology and water quality operational impacts. The analysis shows that WGS technology may be installed for two FCCUs, five SRU/TGUs, and one coke calciner at seven facilities in the refinery sector. However, for the non-refinery sector, WGS technology was not identified as BARCT for the affected equipment.

For water demand, there are three significance thresholds based on whether: 1) the total water demand of the proposed project is less than five million gallons per day; 2) the existing water supply has the capacity to meet the increased demands of the proposed project; and, 3) the potable water demand is less than 262,820 gallons per day. The analysis shows that the increased potential demand for total water during operation that may result from implementing the proposed project either during operation is not expected to exceed the significance threshold of five million gallons of total water demand per day. However, the increased potential demand for potable water during operation of the WGS technology at seven facilities is estimated to be 602,814 gallons per day, which exceeds the potable water threshold of 262,820 gallons per day. Of this amount, three of the seven refineries have current access to recycled water. Should operators of these three facilities commit to utilizing recycled water in lieu of potable water to satisfy the water demand for the NOx control equipment, then, their water suppliers would be able to supply the additional water (e.g., 398,767 gallons per day or 66 percent of the projected water demand) with recycled water.

Thus, while the amount of water demand that would be needed to operate NOx control equipment at Facilities 2, 4, 8, and 9 would be 204,047 gallons per day, which is less than the significance threshold of 262,820 gallons per day of potable water and the significance threshold of five million gallons per day of total water (e.g., potable, recycled, and groundwater), it is not known at this time whether water purveyors would be able to supply potable water for these facilities and it is unknown whether all of the water used at the other three refineries would necessarily consist of recycled water. Because of the drought and the uncertainty of future water supplies, it is not clear at this time whether water suppliers would be able to accommodate the additional operational water demand if the proposed project goes forward, especially if potable water or groundwater would be relied upon to supply the water demand. For this reason, the analysis concludes that the amount of water that may be needed to operate WGS technology may create significant adverse hydrology (water demand) impacts.

Relative to water quality, each affected facility provided their wastewater discharge limits and these limits were compared to each facility's estimated potential increase in wastewater that may result from implementing the proposed project. The peak percentage increase from baseline levels when compared to the proposed project was approximately 12 percent (Refinery 9). An increase of 25 percent would trigger a permit revision and would be considered a significant adverse wastewater impact. Since all of the affected facilities have been shown to have a potential wastewater increase less than 25 percent, no modifications to any existing wastewater discharge permits are anticipated as a result of the proposed project. Thus, the operational impacts of the proposed project on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant. For this reason, the wastewater impacts from the proposed project are expected to be less than significant.

In conclusion, significant adverse water demand impacts are expected during hydrotesting (post-construction) and during operation. Further, less than significant impacts during construction are expected for water demand and wastewater and less than significant impacts during operation are expected for wastewater.

5.3.5.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

In particular to the topic of hydrology and water quality, only 7 of the 20 affected facilities would be expected to have water demand and water quality impacts as a result of the WGS technology that may be installed at these facilities in response to the proposed project. Further, the same 7 facilities that may be affected by the proposed project and the same NOx control technology that may be installed as a result of the proposed project (e.g., WGSs) will also be occur under Alternative 1. Finally, the types and amounts of NOx control equipment that may be installed at the 7 facilities and their corresponding environmental impacts and conclusions in response to the proposed project are also identical to Alternative 1.

The analysis of hydrology and water quality concluded that the proposed project is expected to generate: 1) significant adverse water demand impacts during hydrotesting (post-construction) and during operation; 2) less than significant water demand impacts during for dust suppression activities; and, 3) less than significant impacts during construction and operation for wastewater. Thus, since the analysis of hydrology and water quality impacts concluded that significant water demand impacts would occur during hydrotesting and during operation, and less than significant water demand impacts would occur during construction, the hydrology and water quality impacts analysis under Alternative 1 may also have significant water demand impacts during hydrotesting and operation, and less than significant water demand impacts during construction. Similarly, since the analysis of hydrology and water quality impacts concluded that less than significant water quality impacts would occur during construction and operation, less than significant water quality impacts during construction and operation would also be expected to occur under Alternative 1.

5.3.5.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with fewer adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

In particular to the topic of hydrology and water quality, only 7 of the 20 affected facilities would be expected to have water demand and water quality impacts as a result of the WGS technology that may be installed at these facilities in response to the proposed project. Further, the same 7 facilities that may be affected by the proposed project and the same NOx control technology that may be installed as a result of the proposed project (e.g., WGSs) will also be occur under Alternative 2. Finally, the types and amounts of NOx control equipment that may be installed at the 7 facilities and their corresponding environmental impacts and conclusions in response to the proposed project are also identical to Alternative 2.

The analysis of hydrology and water quality concluded that the proposed project is expected to generate: 1) significant adverse water demand impacts during hydrotesting (post-construction) and during operation; 2) less than significant water demand impacts during for dust suppression activities; and, 3) less than significant impacts during construction and operation for wastewater. Thus, since the analysis of hydrology and water quality impacts concluded that significant water demand impacts would occur during hydrotesting and during operation, and less than significant water demand impacts would occur during construction, the hydrology and water quality impacts analysis under Alternative 2 may also have significant water demand impacts during hydrotesting and operation, and less than significant water demand impacts during construction. Similarly, since the analysis of hydrology and water quality impacts concluded that less than significant water quality impacts would occur during construction and operation, less than significant water quality impacts during construction and operation would also be expected to occur under Alternative 2.

5.3.5.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

In particular to the topic of hydrology and water quality, only seven of the 20 affected facilities would be expected to have water demand and water quality impacts as a result of the WGS technology that may be installed at these facilities in response to the proposed project. Further, the same seven facilities that may be affected by the proposed project and the same NOx control technology that may be installed as a result of the proposed project (e.g., WGSs) may possibly occur under Alternative 3. Finally, the types and amounts of WGS equipment that may be installed at the seven facilities and their corresponding environmental impacts and conclusions in response to Alternative 3 could be the same or less than the proposed project.

The analysis of hydrology and water quality concluded that the proposed project is expected to generate: 1) significant adverse water demand impacts during hydrotesting (post-construction) and during operation; 2) less than significant water demand impacts during for dust suppression activities; and, 3) less than significant impacts during construction and operation for wastewater. Thus, since the analysis of hydrology and water quality impacts concluded that significant water demand impacts would occur during hydrotesting and during operation, and less than significant water demand impacts would occur during construction, the hydrology and water quality impacts analysis under Alternative 3 may also have significant water demand impacts during hydrotesting and operation, and less than significant water demand impacts during construction. Similarly, since the analysis of hydrology and water quality impacts concluded that less than significant water quality impacts would occur during construction and operation, less than significant water quality impacts during construction and operation would also be expected to occur under Alternative 3.

5.3.5.5 Alternative 4 – No Project

Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of hydrology and water quality would be expected. Thus, no significant impacts to hydrology and water quality would be expected to occur under Alternative 4.

5.3.5.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

In particular to the topic of hydrology and water quality, only 7 of the 20 affected facilities would be expected to have water demand and water quality impacts as a result of the WGS technology that may be installed at these facilities in response to the proposed project. Further, the same 7 facilities that may be affected by the proposed project and the same NOx control technology that may be installed as a result of the proposed project (e.g., WGSs) will also be occur under Alternative 5. Finally, the types and amounts of NOx control equipment that may be installed at the 7 facilities and their corresponding environmental impacts and conclusions in response to the proposed project are also identical to Alternative 5.

The analysis of hydrology and water quality concluded that the proposed project is expected to generate: 1) significant adverse water demand impacts during hydrotesting (post-construction) and during operation; 2) less than significant water demand impacts during for dust suppression activities; and, 3) less than significant impacts during construction and operation for wastewater. Thus, since the analysis of hydrology and water quality impacts concluded that significant water demand impacts would occur during hydrotesting and during operation, and less than significant water demand impacts would occur during construction, the hydrology and water quality impacts analysis under Alternative 5 may also have significant water demand impacts during hydrotesting and operation, and less than significant water demand impacts during construction. Similarly, since the analysis of hydrology and water quality impacts concluded that less than significant water quality impacts would occur during construction and operation, less than significant water quality impacts during construction and operation would also be expected to occur under Alternative 5.

5.3.6 Solid and Hazardous Waste

The potential solid and hazardous waste impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of solid and hazardous waste impacts from each alternative relative to the proposed project.

5.3.6.1 Proposed Project

Potential solid and hazardous waste impacts from the proposed project are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.6 – Solid and Hazardous Waste. The analysis in Subchapter 4.6 identified the following activities that have the potential to generate adverse solid hazardous waste impacts during construction and operation:

Construction activities associated with installing NOx control equipment such as demolition and site preparation/grading/excavating could generate solid waste as result of implementing the proposed project. However, the amount of debris generated during construction at 20 facilities would not be expected to exceed the designated capacity of local landfills. For this reason, the construction impacts of the proposed project on waste treatment/disposal facilities were concluded to be less than significant.

Solid waste may also be generated from the operation of the new NOx air pollution control equipment at both the refinery and non-refinery facilities. Further, it is possible that some, if not all, of the 20 affected facilities will address any increase in waste through their existing waste minimization plans. For example, some of the affected facilities in both the refinery and non-refinery sectors currently have existing catalyst-based operations and the spent catalysts are either regenerated, reclaimed or recycled, in lieu of disposal, and this practice would be expected to continue. The overall impacts of the proposed project on waste treatment/disposal facilities due to solid waste that may be generated from both refinery and non-refinery facilities during construction and operation were concluded to be less than significant.

Overall, it was concluded in Subchapter 4.6 that potential solid and hazardous waste impacts from implementing the proposed project would be less than significant. Therefore, project-specific solid and hazardous waste impacts associated with the proposed project are less than significant.

5.3.6.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

Thus, since the solid and hazardous waste impacts were determined to be less than significant during both construction and operation for the proposed project, the solid and hazardous impacts were also determined to be less than significant during both construction and operation under Alternative 1.

5.3.6.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with fewer adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

Thus, since the solid and hazardous waste impacts were determined to be less than significant during both construction and operation for the proposed project, the solid and hazardous impacts were also determined to be less than significant during both construction and operation under Alternative 2.

5.3.6.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

Thus, since the solid and hazardous waste impacts were determined to be less than significant during both construction and operation for the proposed project, the solid and hazardous impacts were also determined to be less than significant during both construction and operation under Alternative 3.

5.3.6.5 Alternative 4 – No Project

Alternative 4 would continue the implementation of the 2005 amendments to the NOx RECLAIM program. Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of solid and hazardous waste would be expected. Thus, no significant impacts to solid and hazardous waste would be expected to occur under Alternative 4.

5.3.6.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

Thus, since the solid and hazardous waste impacts were determined to be less than significant during both construction and operation for the proposed project, the solid and hazardous impacts were also determined to be less than significant during both construction and operation under Alternative 5.

5.3.7 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 proposed project.

5.3.7.1 Proposed Project

Potential direct and indirect transportation and traffic impacts from the proposed project are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.7 – Transportation and Traffic.

Implementation of the proposed project may cause adverse transportation and traffic impacts associated with the existing facilities affected by the proposed project. Specifically, construction-based traffic associated with the installation of NOx control technology are expected from construction workers, delivery trucks and haul trucks. During operation of the proposed project, regular deliveries and waste disposal activities are also expected to increase at each of the affected facilities. Despite the increases, the analysis shows that the transportation and traffic impacts, though adverse, are less than significant for the proposed project during both construction and operation.

5.3.7.2 Alternative 1 – Across the Board Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 1, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 1 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 1. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

Thus, since the transportation and traffic impacts were determined to be less than significant during both construction and operation for the proposed project, the transportation and traffic impacts were also determined to be less than significant during both construction and operation under Alternative 1.

5.3.7.3 Alternative 2 – Most Stringent Shave of NOx RTCs

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 2, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 2 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 2. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical. However, it is possible that under this alternative, facilities could increase their level of control to obtain a compliance margin which would result in a greater air quality benefit from NOx reductions with fewer adverse environmental impacts. Nonetheless, because the quantity and type of NOx control equipment that may be installed beyond what was analyzed for the proposed project is speculative, any potential increased environmental benefit and corresponding impacts that may occur from increasing the level of control to obtain a compliance margin beyond what has been analyzed for the proposed project cannot be analyzed.

Thus, since the transportation and traffic impacts were determined to be less than significant during both construction and operation for the proposed project, the transportation and traffic impacts were also determined to be less than significant during both construction and operation under Alternative 2.

5.3.7.4 Alternative 3 – Industry Approach

Because not as many, if any, additional actual NOx emission reductions would be needed to achieve an overall NOx RTC shave of 8.0 tpd, fewer than the 20 facilities that may be affected by the proposed project will be affected by Alternative 3. Without knowing exactly how industry will react if Alternative 3 is implemented, to predict the number of facilities that would install NOx control equipment would be speculative and unquantifiable. However, to conduct a worst-case analysis without quantification, the number and type of control equipment that may be installed under Alternative 3 is assumed to be fewer than what was analyzed for the proposed project and the corresponding adverse impacts under Alternative 3 would also be fewer than what was analyzed for the proposed project. To be conservative, the same conclusions reached for the proposed project for each environmental topic area will be applied to Alternative 3, except that the impacts will be concluded to have fewer impacts than the proposed project.

Thus, since the transportation and traffic impacts were determined to be less than significant during both construction and operation for the proposed project, the transportation and traffic impacts were also determined to be less than significant during both construction and operation under Alternative 3.

5.3.7.5 Alternative 4 – No Project

Alternative 4 would continue the implementation of the 2005 amendments to the NOx RECLAIM program. Under the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of transportation and traffic would be expected. Thus, no significant impacts to transportation and traffic would be expected to occur under Alternative 4.

5.3.7.6 Alternative 5 – Weighted by BARCT Reduction Contribution

Despite the differences in how facilities are affected by the NOx RTC shave and the amount of the NOx RTC shave under Alternative 5, the amount of potential NOx emission reductions that may be achieved by installing new or modifying existing air pollution control equipment under Alternative 5 is 8.79 tpd, which is identical to the amount of potential NOx emissions reductions estimated for the proposed project. The same 20 facilities that may be affected by the proposed project will also be affected under Alternative 5. Further, the types and amounts of NOx control equipment that may be installed at the 20 affected facilities and their corresponding environmental impacts and conclusion are also identical.

Thus, since the transportation and traffic impacts were determined to be less than significant during both construction and operation for the proposed project, the transportation and traffic impacts were also determined to be less than significant during both construction and operation under Alternative 5.

5.4 COMPARISON OF THE PROPOSED PROJECT TO THE ALTERNATIVES

Pursuant to CEQA Guidelines §15126.6 (d), a CEQA document "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." Accordingly, Table 5-3 provides a matrix displaying the major characteristics and significant environmental effects of the proposed project and each alternative.

Table 5-3

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Aesthetics	Visible steam plumes and new, tall stacks from installing/operating up to 8 WGSs at 7 facilities as follows: FCCU: 2 WGSs SRU/TGU: 5 WGSs Coke Calciner: 1 WGS	Same as proposed project	Same as proposed project, but if facility operators install additional WGSs beyond what is analyzed for the proposed project to obtain a compliance margin, then additional steam plumes and tall stacks could occur.	Less than proposed project	No installation of WGSs (e.g., no visible steam plumes and no new, tall stacks) expected	Same as proposed project
Aesthetics Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project, but potentially more adverse aesthetics impacts if facility operators install additional WGSs beyond what is analyzed for the proposed project)	Less than significant (less than proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)
Air Quality & GHGs	• Reduces total operational NOx emissions by 8.79 tpd • Reduces total NOx RTC holdings by 14.0 tpd • Unused NOx RTCs to be applied to shave is 5.21 tpd • Increases total GHGs by: - 41,785 MT/yr without mitigation; & - 41,100 MT/yr with mitigation • Increases operational use of NaOH (a TAC) by 5.84 tpd	Same as proposed project	• Reduces total operational NOx emissions by 8.79 tpd • Reduces total NOx RTC holdings by 15.87 tpd • Unused NOx RTCs to be applied to shave is 7.08 tpd • Increases total GHGs by: • - 41,785 MT/yr without mitigation; & - 41,100 MT/yr with mitigation • Increases operational use of NaOH (a TAC) by 5.84 tpd	• Less operational NOx reductions than proposed project but not quantifiable • Reduces total NOx RTC holdings by 8.00 tpd • Less increases to GHGs than proposed project, but not quantifiable before or after mitigation • Less increases in operational use of NaOH (a TAC) but not quantifiable	• No decreases in total operational NOx emissions. • No increases in construction emissions for any pollutant.	Same as proposed project

Table 5-3 (continued)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**Alternative 1: Across the Board Shave** ***(All facilities reduce 53%)***	**Alternative 2: Most Stringent Shave** ***(All facilities reduce 60%)***	**Alternative 3: Industry Approach** ***(All facilities reduce 33%)***	**Alternative 4: No Project**	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**
Air Quality & GHGs (concluded)	• Increases operational use of NH3 (a TAC) by 39.5 tpd • Increases peak daily operation emissions as follows: <u>VOC</u>: 17 lb/day <u>CO</u>: 75 lb/day <u>NOx:</u> 190 lb/day* <u>PM10:</u> 22 lb/day <u>PM2.5:</u> 19 lb/day • Increases peak daily emissions for construction in same year as follows: <u>VOC</u>: 429 lb/day <u>CO</u>: 2,745 lb/day <u>NOx:</u> 1,656 lb/day <u>SOx</u>: 3 lb/day <u>PM10:</u> 1,758 lb/day without mitigation; & 1,009 lb/day with mitigation <u>PM2.5:</u> 883 lb/day without mitigation; & 508 lb/day with mitigation	Same as proposed project	• Increases operational use of NH3 (a TAC) by 39.5 tpd Increases peak daily operation emissions as follows: <u>VOC</u>: 17 lb/day <u>CO</u>: 75 lb/day <u>NOx:</u> 190 lb/day* <u>PM10:</u> 22 lb/day <u>PM2.5:</u> 19 lb/day • Increases peak daily emissions for construction in same year as follows: <u>VOC</u>: 429 lb/day <u>CO</u>: 2,745 lb/day <u>NOx:</u> 1,656 lb/day <u>SOx</u>: 3 lb/day <u>PM10:</u> 1,758 lb/day without mitigation; & 1,009 lb/day with mitigation <u>PM2.5:</u> 883 lb/day without mitigation; & 508 lb/day with mitigation • If additional controls are installed beyond the proposed project for a compliance margin, more emission benefits as well as increased emissions impacts could occur.	• Less increases in operational use of NH3 (a TAC) but not quantifiable • Less increases in peak daily operation emissions but not quantifiable • Less increases in peak daily emissions for construction but not quantifiable with or without mitigation	• No decreases in total operational NOx emissions • No increases in construction emissions for any pollutant.	Same as proposed project

* The potential increases in NOx operational emissions are more than offset by the overall project reductions.

Table 5-3 (continued)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**Alternative 1: Across the Board Shave** ***(All facilities reduce 53%)***	**Alternative 2: Most Stringent Shave** ***(All facilities reduce 60%)***	**Alternative 3: Industry Approach** ***(All facilities reduce 33%)***	**Alternative 4: No Project**	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**
Air Quality & GHG Impacts Significant?	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd. • Less than significant for VOC, CO, PM10 and PM2.5 during operation • Significant for GHGs • Less than significant for TACs use (NaOH and NH3) during operation • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd (same as proposed project) • Less than significant for VOC, CO, PM10 and PM2.5 during operation (same as proposed project) • Significant for GHGs (same as proposed project) • Less than significant for TACs use (NaOH and NH3) during operation (same as proposed project) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (same as proposed project)	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd (same as proposed project) • Less than significant for VOC, CO, PM10 and PM2.5 during operation (same as proposed project) • Significant for GHGs (same as proposed project) • Less than significant for TACs use (NaOH and NH3) during operation (same as proposed project) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (same as proposed project) • If additional controls are installed beyond the proposed project for a compliance margin, more emission benefits and increased emissions could occur.	• Less than significant; achieves net NOx emission reductions during operation (less reductions than the proposed project but not quantifiable) • Less than significant increases in VOC, CO, PM10 and PM2.5 during operation (less than the proposed project but not quantifiable) • Significant for GHGs, (less than proposed project but not quantifiable) • Less than significant for TACs use (NaOH and NH3) during operation (less than the proposed project but not quantifiable) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (less than proposed project but not quantifiable)	• No Impact - Not Significant • Does not achieve required AQMP NOx emission reductions during operation • Does not comply with BARCT assessment requirements per Health and Safety Code	• Less than significant, achieves net NOx emission reductions during operation by 8.72 tpd (same as proposed project) • Less than significant for VOC, CO, PM10 and PM2.5 during operation (same as proposed project) • Significant for GHGs(same as proposed project) • Less than significant for TACs use (NaOH and NH3) during operation (same as proposed project) • Significant for VOC, CO, NOx, PM10, and PM2.5 during construction (same as proposed project)

Table 5-3 (continued)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Energy	• During construction: -Increased use of diesel by 15,855 gal/day -Increase use of gasoline by 5,422 gal/day • During operation: -Increased use of electricity by 214 MWh/day -Increased use of diesel by 8,380 gal/day	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, increased energy use during construction and operation could occur	Less than the proposed project	No increases in energy uses during construction or operation	Same as proposed project
Energy Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased energy use than the proposed project could occur.)	Less than significant (less than the proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)
Hazards & Hazardous Materials	Increased use of 5.84 tons/day of NaOH and 39.5 tons/day of NH3 (both TACs) used during operation.	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional NaOH and NH3 may be needed.	Less than the proposed project	No change to existing hazards and hazardous materials used	Same as proposed project
Hazards & Hazardous Materials Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased use of NaOH and NH3 could occur.)	Less than significant	No Impact - Not Significant	Less than significant (same as proposed project)

Table 5-3 (continued)

Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities	Alternative 1: Across the Board Shave *(All facilities reduce 53%)*	Alternative 2: Most Stringent Shave *(All facilities reduce 60%)*	Alternative 3: Industry Approach *(All facilities reduce 33%)*	Alternative 4: No Project	Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors
Hydrology & Water Quality	• During construction: -Increased use of water for dust suppression by 12,501 gal/day -Increased use of water for hydrotesting by 353,724 gal/day • During operation -Increased use of potable water by 602,814 gal/day (of which up to 204,047 gal/day could potentially be supplied by recycled water) -Increased generation of wastewater by 236,719 gal/day.	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional water demand and increased wastewater generation may occur.	Less than the proposed project	No change to existing water demand or wastewater discharge	Same as proposed project
Hydrology & Water Quality Impacts Significant?	• Significant for water demand during hydrotesting (assuming entire demand is based on potable water) • Significant for water demand during operation (assuming entire demand is based on potable water) • Less than significant for water demand during construction • Less than significant for wastewater discharge during construction and operation	-Significant for water demand (same as proposed project) -Less than significant for wastewater discharge (same as proposed project)	-Significant for water demand (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased use of water during construction and operation may be needed) -Less than significant for wastewater discharge (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, then additional wastewater may be discharged	-Significant for water demand (less than proposed project) -Less than significant for wastewater discharge (less than proposed project)	No Impact - Not Significant	-Significant for water demand (same as proposed project) -Less than significant for wastewater discharge (same as proposed project)

Table 5-3 (concluded)
Comparison of Adverse Environmental Impacts of the Alternatives

Environmental Topic Area	**Proposed Project: Shave Applied to 90 percent of RTC Holders – 65 facilities**	**Alternative 1: Across the Board Shave** ***(All facilities reduce 53%)***	**Alternative 2: Most Stringent Shave** ***(All facilities reduce 60%)***	**Alternative 3: Industry Approach** ***(All facilities reduce 33%)***	**Alternative 4: No Project**	**Alternative 5: Weighted by BARCT Reduction Contribution for all facilities & investors**
Solid & Hazardous Waste	• During construction: -Increased generation of non-hazardous solid waste • During operation: -Increased generation of non-hazardous solid waste that can be recycled	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional solid waste may be generated.	Less than the proposed project	No change to existing disposal of solid & hazardous waste	Same as proposed project
Solid & Hazardous Waste Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if additional controls are installed beyond the proposed project for a compliance margin, increased use of water during construction and operation may be needed)	Less than significant (less than the proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)
Transportation & Traffic	Overall peak increase in transportation and traffic of 485 trips per day during construction and 65 trips per day during operation.	Same as proposed project	Same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional daily trips during construction and operation may be needed.	Less than the proposed project	No change to existing transportation and traffic.	Same as proposed project
Transportation & Traffic Impacts Significant?	Less than significant	Less than significant (same as proposed project)	Less than significant (same as proposed project but if facility operators install additional NOx controls beyond what is analyzed for the proposed project to obtain a compliance margin, additional daily trips during construction and operation may be needed)	Less than significant (less than the proposed project)	No Impact - Not Significant	Less than significant (same as proposed project)

5.5 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 a CEQA document 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 5.1, the range of feasible alternatives to the proposed project 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 subsection identifies Alternative 4 to the proposed project, as being rejected due to infeasiblity for the reasons explained in the following subsection.

5.5.1 Alternative 4 - No Project

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 implementation of a control measure that has been adopted and legally mandated in the 2012 AQMP. Adopting a No Project alternative for implementing a control measure in the 2012 AQMP does not automatically imply that no further action will be taken (e.g., halting implementation of the existing 2012 AQMP). The federal and state Clean Air Acts require the SCAQMD to implement the AQMP in order to attain all state and national ambient air quality standards. Thus, a No Project alternative in the case of the proposed project is not a legally viable alternative because it undermines the legal requirements in the 2012 AQMP. Consequently, the No Project alternative presented in this Draft PEA is the continued implementation of the 2005 amendments to the NOx RECLAIM program. Further, it is also unclear whether or not continued implementation of the 2005 amendments to the NOx RECLAIM program is a feasible alternative because the SCAQMD is required to conduct a BARCT reassessment in accordance with Health and Safety Code §§40440 and 39616 that demonstrates achievable NOx emission reductions.

"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 and GHG emissions, there would be no further incremental impacts on the existing environment if no further action is taken. Although there are other existing rules that may have future compliance dates for NOx emission reductions, potential adverse impacts from these rules have already been evaluated in the Final Program EIR for the 2012 AQMP and their subsequent rule-specific CEQA documents. While air quality would continue to improve to a certain extent, 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.

5.6 LOWEST TOXIC AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

5.6.1 Lowest Toxic Alternative

In accordance with SCAQMD's policy document Environmental Justice Program Enhancements for FY 2002-03, Enhancement II-1 recommends for all SCAQMD CEQA documents which are required to include an alternatives analysis, the alternative analysis shall 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.

As explained in Subchapter 4.4 – Hazards and Hazardous Materials, implementation of the proposed project may alter the hazards and hazardous materials associated with the existing facilities affected by the proposed project. Air pollution control equipment and related devices are expected to be installed or modified at affected facilities such that their operations may increase the quantity of materials used in the control equipment, some of which are hazardous. . The main NOx reduction technologies considered for the proposed project are based on employing mostly SCR and WGS technologies. The analysis shows that of the possible NOx controls that may be employed, both SCR and WGS technologies may increase the use of toxic materials such as aqueous ammonia and sodium hydroxide (NaOH), respectively. In addition, one UltraCat DGS that may be considered for Refinery 2 would also utilize aqueous ammonia for its operation. Some WGSs, but not all, rely on the use of sodium hydroxide (NaOH) caustic solution as the scrubbing agent. NaOH is a toxic air contaminant (TAC) that is a non-cancerous but acutely hazardous substance and is used in WGSs for controlling NOx emissions from FCCUs, SRU/TGUs, coke calciners, and glass melting. Despite the potential increased use in ammonia and NaOH, the overall analysis concluded that the proposed project would generate less than significant adverse hazards and hazardous materials impacts.

To identify a lowest toxic alternative with respect to the proposed project, a lowest toxic alternative would be if NOx control technologies are employed that use the least amount of hazardous or toxic materials However, because each of the alternatives, except Alternative 3 – Industry Approach and Alternative 4 – the No Project alternative, assumes that the same type and amounts of NOx control equipment on at the same affected facilities will be installed, the amount of hazardous materials that may be needed to operate the various NOx control equipment under each alternative (except for Alternatives 3 and 4) would also be the same. While Alternative 3 results in fewer toxic emissions, it is not the environmentally superior alternative because it results in far fewer NOx benefits thant the proposed project, which already has less than significant toxic impacts.

As explained in subsection 5.3.4.5, under Alternative 4, the No Project alternative, no new NOx limits are proposed for any equipment/source category and no NOx RTC reductions are proposed. Thus, none of the 20 facilities that would be affected by the proposed project would be affected by Alternative 4 to the extent that no control equipment would be installed or modified, and no adverse impacts from construction and operating the new or modified control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative 4, no new impacts to the environment, including the topic of hazards and hazardous materials would be expected. Thus, no increased use in the amount of hazardous or toxic materials would occur if Alternative 4 is implemented.

Thus, from a hazard and air toxics perspective, when compared to the proposed project and the other alternatives under consideration, if implemented, Alternative 4 is considered to be the lowest toxic alternative, but it is not the environmentally superior alternative because it does not achieve that NOx reductions that would result from the proposed project.

5.6.2 Environmentally Superior Alternative

Pursuant to CEQA Guidelines §15126.6 (e)(2), if the environmentally superior alternative is the "no project" alternative, the CEQA document shall also identify an alternate environmentally superior alternative from among the other alternatives. Alternative 4, the No Project alternative, would result in the continued implementation of the 2005 amendments to the NOx RECLAIM program and is considered to be the least toxic alternative because it is not expected to generate any significant adverse impacts to any environmental topic areas without providing any environmental benefits.

Alternative 4, the No Project alternative, is not the environmentally superior alternative because it does not achieve the NOx reductions as the proposed project or Alternatives 1, 2 and 5. However, if the amount of shave that would be applied by each of these alternatives is taken into consideration as an indicator to how facility operators may respond to the reduced amount of available NOx RTCs in the market, then the alternative with highest amount of proposed shave of NOx RTC holdings, Alternative 2, would have the greatest chance of ensuring that all control equipment that is contemplated would be installed in order to ensure that the maximum amount of NOx emissions reductions projected would actually occur. Thus, of Alternatives 1 ,2, 3 and 5, Alternative 2 would be considered the environmentally superior alternative.

5.7 CONCLUSION

Of the five alternatives analyzed, Alternative 4 would generate the least severe and fewest number of environmental impacts compared to the proposed project. However, of the project alternatives, Alternative 4 would achieve the fewest of the project objectives and would have the fewest NOx reduction benefits.

Alternatives 1, 2, and 5 would all be expected to generate equivalent impacts to proposed project in all environmental topic areas analyzed. Alternative 3 would provide the least amount of of actual NOx emission reductions (except for the Alternative 4 – the No Project alternative), while Alternative 2 would provide the greatest amount of actual NOx emission reductions. Alternatives 1, 2, 3, and 5 all propose to shave the NOx RTC holdings of 210 facilities which represent the bottom 10 percent of NOx RTC holders. By applying a shave in this manner, the 210 facilities would become potential future buyers of RTCs since the amount of RTC holdings for these facilities would become less than their current actual emissions for Alternatives 1, 2, 3 and 5. For this reason, none of Alternatives 1, 2, 3 and 5 would satisfy Objective No. 2 "to modify the RTC "shaving" methodology to implement the emission reductions per the BARCT assessment" (the project objectives are described on page 2-4 in Chapter 2). Thus, the proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to construction and operation activities while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

CHAPTER 6

REFERENCES

6.0 REFERENCES

California State Board of Equalization (BOE), 2013. Taxable Diesel Gallons 10 Year Report; 2013 data; Fuel Taxes Statistics & Reports, Motor Vehicle Fuel; accessed August 2014. http://www.boe.ca.gov/sptaxprog/reports/Diesel_10_Year_Report.pdf

BOE, 2013a. Taxable Gasoline Gallons 10 Year Report; 2013 data; Fuel Taxes Statistics & Reports, Motor Vehicle Fuel; accessed August 2014. http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf

California Coastal Commission, 2014. California Coastal Act of 1976. Updated 2014

Caltrans, Scenic Highway Guidelines - Appendix E, October 2008. http://www.dot.ca.gov/hq/LandArch/scenic/guidelines/scenic_hwy_guidelines_04-12-2012.pdf

Caltrans, Eligible and Officially Designated Routes, accessed August 2014. http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

Caltrans, Officially Designated State Scenic Highways, accessed August 2014. http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm

California Air Resources Board (CARB), 2000. Diesel Risk Reduction Plan (DRRP) to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles; adopted September 2000. http://www.arb.ca.gov/diesel/documents/rrpapp.htm

California Employment Development Department, 2015. Labor Market Information Division, California Labor Market Current Status. May/June 2015. http://www.labormarketinfo.edd.ca.gov/county/sbern.html#URLF

California Energy Commission (CEC), 2003. Staff White Paper Liquefied Natural Gas in California: History, Risks, and Siting, July 2003, 700-03-005. http://www.energy.ca.gov/reports/2003-07-17_700-03-005.PDF

CEC, 2005a. Staff Final Report California Energy Demand 2006-2016, Staff Energy Demand Forecast, Revised September 2005, CEC-400-2005-034-SF-ED2.

CEC, 2005b. Staff Final Report California's Water – Energy Relationship, CEC-700-2005-011-SF, November 2005. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

CEC, 2011. Transportation Energy Forecasts and Analyses for the 2011 Integrated Energy Policy Report, August 2014.

CEC, 2011a. California's Major Sources of Energy, August 2014. http://energyalmanac.ca.gov/overview/energy_sources.html

CEC, 2011b. List of Geothermal Power Plants in California, August 2014. http://energyalmanac.ca.gov/renewables/

CEC, 2012. Retail Diesel Sales by County, accessed August 2014. http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_diesel_sales_by_county.html

CEC, 2013. 2013 Integrated Energy Policy Report, August 2014. http://www.energy.ca.gov/2013_energypolicy/

CEC, 2013a. Annual Generation, August 2014. http://energyalmanac.ca.gov/electricity/web_qfer/Annual_Generation.php

CEC, 2013b. Electric Generation Capacity & Energy, August 2014. http://energyalmanac.ca.gov/electricity/electric_generation_capacity.html

CEC, 2013c. Energy Consumption Data Management System, Energy Consumption by County, 2013. http://www.ecdms.energy.ca.gov/elecbycounty.aspx

CEC, 2013c CEC, 2013. Natural Gas Supply By Region, August 2014. http://energyalmanac.ca.gov/naturalgas/natural_gas_supply.html

CEC, 2013d CEC, 2013c. Oil Supply Sources to California Refineries, August 2014. http://energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts.html

CEC, 2013 e CEC, 2013d. Total Electricity System Power for 2013: Changes From 2012, August 2014. http://energyalmanac.ca.gov/electricity/total_system_power.html

CEC, 2014. California Energy Consumption Database, August 2014. http://www.ecdms.energy.ca.gov/

CEC, 2014a CEC, 2014. California Energy Demand: 2014-2024, August 2014. http://www.energy.ca.gov/2013publications/CEC-200-2013-004/CEC_200-2013-004-SD-V1-REV.pdf

CEC, 2014b CEC, 2014a. California Geothermal Energy Statistics & Data, August 2014. http://energyalmanac.ca.gov/renewables/geothermal/index.html

CEC, 2014c CEC, 2014b. California Hydroelectric Statistics & Data, June 2012. http://energyalmanac.ca.gov/renewables/hydro/index.html

CEC, 2014d CEC, 2012b. California Solar Energy Statistics & Data, August 2014. http://energyalmanac.ca.gov/renewables/solar/index.html

CEC, 2014e CEC, 2014c. Database of California Power Plants, May 2014.

CEC, 2014f CEC, 2012e. Overview of Natural Gas in California, August 2014. http://www.energyalmanac.ca.gov/naturalgas/overview.html

CEC, 2014g CEC, 2014d. Renewables Portfolio Standard: Quarterly Report, August 2014. http://www.cpuc.ca.gov/NR/rdonlyres/93E7E363-75A6-40C8-997D-705C53A2713D/0/2014Q1RPSReportFINAL.pdf

CEC, 2014h CEC, 2012. Retail Biodiesel and E-85 Sales, accessed August 2014. http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_biodiesel+e85_sales.html

CEC, 2014i CEC, 2012f. Retail Fuel Report and Data for California, August 2014. http://energyalmanac.ca.gov/gasoline/piira_retail_survey.html

CEC, 2014j CEC, 2014e. Waste to Energy & Biomass in California, August 2014. http://www.energy.ca.gov/biomass/index.html

CEC, 2014k CEC, 2014f. Wind Energy in California, August 2014. http://www.energy.ca.gov/wind/index

California Office of the Governor, 2008. Executive Order S-06-08, 2008 – Declaration of Statewide Drought, June 2008. http://gov.ca.gov/news.php?id=9797

California Office of the Governor, 2009. State of Emergency- Water Shortage, 2009. http://gov.ca.gov/news.php?id=11557

California Office of the Governor, 2013. Executive Order B-21-13 - Streamline Approvals for Water Transfers to Protect California's Farms, May 2013. http://gov.ca.gov/news.php?id=18048

California Office of the Governor, 2014. State of Emergency- Water Shortage, January 2014. http://gov.ca.gov/news.php?id=18368

California Office of the Governor, 2014. Governor Brown, Legislative Leaders Announce Emergency Drought Legislation, February 2014. http://gov.ca.gov/news.php?id=18415

CalRecycle, 2012. Solid Waste Information System (SWIS), August 2014. http://www.calrecycle.ca.gov/SWFacilities/Directory/search.aspx

CalRecycle, 2015a. Solid Waste Information System (SWIS): Commerce Refuse-To-Energy Facility, August 2015. http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0506/Detail

CalRecycle, 2015b. Solid Waste Information System (SWIS): Southeast Resource Recovery Facility, August 2015. http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AK-0083/Detail/

CEQA Guidelines (codified at Title 14 California Code of Regulations, §15000 et seq): https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I95DAAA70D48811DEBC02831C6D6C108E&originationContext=documenttoc&transitionType=Default&contextData=%28sc.Default%29

Consumer Energy Center, 2012. Alternative Fuel Vehicles, August 2014. http://www.consumerenergycenter.org/transportation/afvs/

Consumer Energy Center, 2012a. Biodiesel as a Transportation Fuel, August 2014. http://www.consumerenergycenter.org/transportation/afvs/biodiesel.html

Consumer Energy Center, 2012b. Ethanol as a Transportation Fuel, August 2014. http://www.consumerenergycenter.org/transportation/afvs/ethanol.html

Consumer Energy Center, 2012c. Geothermal Energy. August 2014. http://www.consumerenergycenter.org/renewables/geothermal/index.html

Desert Sun, The, 2014. Gov. Jerry Brown Signs Landmark Groundwater Legislation, September 30, 2014. http://www.desertsun.com/story/news/environment/2014/09/16/california-groundwater-legislation/15725863/

Department of Water Resources (DWR), 1998. The California Water Plan, September 2014.

DWR, 2010. California Water Plan Update, 2009. Integrated Water Management. Bulletin 160-109, September 2014.

DWR, 2014. Late Storms Allow 5 Percent Allocation to State Water Project Users, April 18, 2014. http://www.water.ca.gov/news/newsreleases/2014/041814.pdf

Department of Toxic Substances Control (DTSC), 2011. Hazardous Waste Tracking System. Total Yearly Tonnage by Waste Coder Report. August 2014. http://hwts.dtsc.ca.gov/report_list.cfm

Eagleson, S.T., et al., A Logical and Cost Effective Approach for Reducing Refinery FCCU Emissions. G. Billemeyer, N. Confuorto, and E. H. Weaver of BELCO, and S. Singhania and N. Singhania of Singhania Technical Services Pvt., India, Presented at PETROTECH 6th International Petroleum Conference in India, January 2005.

Fiore, Arlene, et al., 2002. "Background Ozone Over the United States in Summer: Origin, Trend, and Contribution to Pollution Episodes," Journal of Geophysical Research - Atmospheres, Vol. 107 - D15, 2002, pp. ACH 11-1–ACH 11-25. https://gfdl.noaa.gov/bibliography/related_files/amf0202.pdf

Foss, Michelle Michot, Ph.D., 2003. LNG Safety and Security. Center for Energy Economics. October, 2003 (revised November 2006) http://www.beg.utexas.edu/energyecon/lng/documents/CEE_LNG_Safety_and_Security.pdf.

Intermodal Container Transfer Facility (ICTF) Joint Powers Authority, 2009. Notice of Preparation and Initial Study, Intermodal Container Transfer Facility Modernization and Expansion Project, January, 2009.

Jacobson, Mark Z, 2010. "Enhancement of Local Air Pollution by Urban CO2 Domes," Environmental Science and Technology, as describe in Stanford University press release on March 16, 2010 available at: http://news.stanford.edu/news/2010/march/urban-carbon-domes-031610.html

Lewis-Presley Air Quality Management Act, The, 1976 Cal. Stats., ch 324 (codified at Health and Safety Code, §§40400-40540).

Los Angeles County, 2014, 2014 Draft General Plan 2035, July 2014; 2014 http://planning.lacounty.gov/generalplan/draft2014

Los Angeles County Department of Public Works (LACDPW), 1988. Los Angeles County Hazardous Waste Management Plan, Volumes I-III, August 2014.

LACDPW, 2013. 2012 Annual Report, County of Los Angeles Countywide Integrated Waste Management Plan. August, 2013. http://dpw.lacounty.gov/epd/swims/docs/pdf/CIWMP/2012.pdf

Los Angeles Department of Water and Power (LADWP), 2010. Urban Water Management Plan 2010.

Los Angeles Harbor Department, 2011. Southern California International Gateway Project, Draft Environmental Impact Report, September, 2011.

Los Angeles Regional Water Quality Control Board (LARWQCB), 1994. 2007 Water Quality Control Plan Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, 1994. http://www.swrcb.ca.gov/rwqcb4/water_issues/programs/basin_plan/basin_plan_documentation.shtml

Long Beach Gas & Oil Department (LBGOD), 2014. Welcome to the Long Beach Gas & Oil Department, August 2014. http://admin.longbeach.gov/lbgo/default.asp

Metropolitan Water District of Southern California (Metropolitan), 2010. The Regional Urban Water Management Plan. September 2014.

Metropolitan, 2012. Annual Progress Report to the California State Legislature. February, 2012.

National Fire Protection Association, 2015. FAQ for Standard 704 – Standard System for the Identification of the Hazards of Materials for Emergency Response. Updated March 2015. http://www.nfpa.org/Assets/files/AboutTheCodes/704/704_FAQs.pdf

Orange County, 2011, Orange County General Plan 2005, March 2011. http://ocplanning.net/planning/generalplan2005

Regional Landfill Options for Orange County (RELOOC), 2007. Regional Landfill Options for Orange County. Strategic Plan Update 2007.

Riverside County General Plan, March 2014; (Riverside County, 2014). http://planning.rctlma.org/ZoningInformation/GeneralPlan.aspx

Sacramento Bee, 2014a. California Orders Thousands of Sacramento Valley Water Users to Stop Pumping from Streams, May 29, 2014. http://www.sacbee.com/news/local/article2600034.html

Sacramento Bee, 2014b. Gov. Brown Orders More Emergency Drought Measures, April 25, 2014. http://www.sacbee.com/news/state/california/water-and-drought/delta/article2597015.html

Sacramento Bee, 2014c. Jerry Brown Signs Drought Relief Package, March 1, 2014. http://blogs.sacbee.com/capitolalertlatest/2014/03/jerry-brown-signs-drought-relief-package-in-dry-california.html

San Bernardino County, 2014. County of San Bernardino 2007 General Plan, last amended April 2014. http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FINALGP.pdf

SCAG, 2008. 2008 Regional Transportation Plan Program Environmental Impact Report, August 2010.

SCAG, 2012. Final Program Environmental Impact Report for the 2012-2035 RTP/SCS, SCH# 2011051018; April 4, 2012. http://rtpscs.scag.ca.gov/Pages/Final-2012-PEIR.aspx

SCAG, 2012a. Draft Program Environmental Impact Report for the 2012 – 2035 RTP/SCS. Accessed August, 2014. http://rtpscs.scag.ca.gov/Pages/Draft-2012-PEIR.aspx

SCAG, 2012b. Regional Transportation Plan 2012-2035, August 2014. http://rtpscs.scag.ca.gov/Pages/Final-2012-PEIR.aspx

SCAQMD, 2001. Final Environmental Impact Report for: ARCO CARB Phase 3/MTBE Phase-Out Project, SCH. No. 2000061074; certified May 2001.

SCAQMD, 2001. Final Environmental Impact Report for: Chevron El Segundo CARB Phase 3 Clean Fuels Project, SCH. No. 2000081088; certified November 2001.

SCAQMD, 2001. Final Environmental Impact Report for: Proposed Equilon Enterprises LLC CARB Phase 3 Reformulated Gasoline Project, SCH. No. 2000091086; certified October 2001.

SCAQMD, 2001. Final Environmental Impact Report for: Mobil CARB Phase 3 Reformulated Gasoline Project, SCH. No. 2000081105; certified October 2001.

SCAQMD, 2001. Final Environmental Impact Report for: Proposed Tosco Los Angeles Refinery Phase 3 Reformulated Fuels Project, SCH. No. 2000091056; certified April 2001.

SCAQMD, 2001. Final Environmental Impact Report for: Proposed Ultramar Wilmington Refinery – CARB Phase 3 Project, SCH. No. 2000061113; certified December 2001.

SCAQMD, 2007. Final Environmental Impact Report for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects, SCH No. 2006111138, certified June 2007. http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2007/feir-for-conocophillips-pm10-and-nox-reduction

SCAQMD, 2008. CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans. Governing Board Letter, December 5, 2008. Accessed August 2015 http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-%28ghg%29-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2

SCAQMD, 2010. Final Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM), SCH No. 2009061088, SCAQMD No. 06182009BAR, certified November 5, 2010. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2010/final-program-environmental-assessment-for-proposed-amended-regulation-xx.pdf?sfvrsn=4

SCAQMD, 2012. Final 2012 Lead State Implementation Plan – Los Angeles County. May 2012. http://www3.aqmd.gov/hb/attachments/2011-2015/2012May/2012-May4-030.pdf

SCAQMD, 2013. Control Measure #CMB-01: Further NOx Reductions from RECLAIM; 2012 Final Air Quality Management Plan, February 2013.

SCAQMD, 2014. Final Negative Declaration for: Phillips 66 Los Angeles Refinery Carson Plant Crude Oil Storage Capacity Project, SCH. No. 2013091029, December 2014. http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2014/phillips-66-fnd.pdf?sfvrsn=2

United States Department of Energy (USDOE), 2003. Just the Basics: Liquefied Petroleum Gas, August 2003. http://www1.eere.energy.gov/vehiclesandfuels/pdfs/basics/jtb_lpg.pdf

USDOE, 2013. Anaerobic Digestion Basics, August 2014. http://energy.gov/eere/energybasics/articles/anaerobic-digestion-basics

USDOE, 2013a. Biomass Technology Basics, August 2014. http://energy.gov/eere/energybasics/articles/biomass-technology-basics

USDOE, 2014. Alternative Fueling Station Locator, August 2014. http://www.afdc.energy.gov/afdc/locator/stations/state

USDOE, 2014a. Energy Basics: Geothermal Electricity Production, August 2014. http://energy.gov/eere/energybasics/articles/geothermal-technology-basics

U. S. Department of Transportation (USDOT), 2010. 2007 Commodity Flow Survey Hazardous Materials, August 2014 http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/commodity_flow_survey/2007/hazardous_materials/index.html

U.S. Energy Information Administration (USEIA), 2012. California Energy Fact Sheet. July 2012, http://www.eia.gov/state/state-energy-profiles.cfm?sid=CA

USEIA, 2012a. Consumption of Natural Gas for Electricity Generation by State, by Sector, August 2014.. http://www.eia.gov/electricity/annual/html/epa_05_12.html

USEIA, 2012b. Net Generation from Wind, August 2014. http://www.eia.gov/electricity/annual/html/epa_03_17.html

USEIA, 2012c. Total Petroleum Consumption Estimates; Table F15, August 2014. http://www.eia.gov/state/seds/data.cfm?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US&sid=CA

USEIA, 2013. Natural Gas Consumption by End Use, August 2014. http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.html

USEIA, 2013a. Renewable Energy Explained, August 2014. http://www.eia.gov/energyexplained/index.cfm?page=renewable_home

USEIA, 2014. Alternative Fuel Vehicle Data, August 2014. http://www.eia.gov/renewable/afv/users.cfm#tabs_charts-5

USEIA, 2014a. California State Profile and Energy Estimates, Quick Facts; accessed August 2014. http://www.eia.gov/state/?sid=CA&CFID=16957926&CFTOKEN=f27a8712ad923a0a-6D522B58-237D-DA68-24E25846F72A3365&jsessionid=84301d78ae226ef8ee07326b113a3b1a7331

USEIA, 2014b. State Profiles and Energy Estimates, Rankings: Crude Oil Production, April 2014. http://www.eia.gov/state/rankings/?sid=US&CFID=16318874&CFTOKEN=ae573cdc61654233-EE9BD34F-25B3-1C83-54586F32B366D836&jsessionid=8430a691f97d1894bc33d35305b7d1c231a9#/series/46

U.S. Environmental Protection Agency (USEPA), 2005. Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations, 40 CFR Part 51, Federal Register 39104, July 6, 2005. http://www.gpo.gov/fdsys/pkg/FR-2005-07-06/pdf/05-12526.pdf

USEPA, 2005a. Stormwater Phase II Final Rule, Small Construction Program Overview. EPA 833-F-00-013. January, 2000 (revised December 2005).

USEPA, 2006. Air Quality Criteria Document for Lead Final Report: EPA/600/R-05/144aF-bF. October 2006.

Vingarzan, Roxanne, 2004. A Review of Surface Ozone Background Levels and Trends; Atmospheric Environment, Volume 38, 2004, pp. 3431–3442. http://www.sciencedirect.com/science/article/pii/S1352231004002808

Weaver, Edwin H., 2006. Evaluating Wet Scrubbers. Belco Technologies Corporation. Petroleum Quarterly, Quarter 2, 2006.

6.1 ORGANIZATIONS AND PERSONS CONSULTED

The CEQA statutes and Guidelines require that organizations and persons consulted be provided in the PEA. 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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California Energy Commission

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West Basin Municipal Water District

Edward Hutter
Dupont

Rob Wood
Native American Heritage Commission

CHAPTER 7

ACRONYMS

7.0 ACRONYMS

ABBREVIATION = DESCRIPTION

μg/m3 = micrograms per cubic meter
ACGIH = American Conference of Governmental Industrial Hygiene
APS = Alternative Planning Strategy
AQMP = Air Quality Management Plan
ASME = American Society of Mechanical Engineers
ATCM = Airborne Toxic Control Measure
ATCP = Air Toxics Control Plan
AVTA = Advanced Vehicle Testing Activity
B100 = biodiesel
BACM = Best Available Control Measure
BACT = Best Available Control Technology
BARCT = Best Available Retrofit Control Technology
BART = Best Available Control Technology
Basin = South Coast Air Basin
BAU = business-as-usual
BLEVE = boiling liquid expanding vapor explosion
BLM = Bureau of Land Management
BMP = best management practice
BPTCP = Bay Protection and Toxic Cleanup Plan
C3H8 = propane
CAA = Clean Air Act
CAFE = Corporate Average Fuel Economy
CalARP = California Accidental Release Prevention Program
CalEMA = California Emergency Management Agency
CalEPA = California Environmental Protection Agency
CalOSHA = California Occupational Safety and Health Administration
Caltrans = California Department of Transportation
CaOH = calcium hydroxide
CAPCOA = California Air Pollution Control Officers Association
CARB = California Air Resources Board
CCAR = California Climate Action Registry
CCP = Clean Communities Plan
CCR = California Code of Regulations
CEC = California Energy Commission
CEMS = continuous emissions monitor system
CEQA = California Environmental Quality Act
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CERs = Certified Emission Reductions

CFR = Code of Federal Regulations
CH4 = methane
CHMIRS = California Hazardous Materials Incident Reporting System
CHP = California Highway Patrol
CI = compressed engines
CIP = Capital Improvement Program
CIWMP = Countrywide Integrated Waste Management Plan
CM = control measure
CMA = Congestion Management Agency
CNG = compressed natural gas
CO = carbon monoxide
CO2 = carbon dioxide
CO2eq = carbon dioxide equivalent
COD = chemical oxygen demand
COHb = carboxyhemoglobin
CPCC = California Portland Cement Company
CPSC = Consumer Products Safety Commision
CPUC = California Public Utilities Commission
CRA = Colorado River Aqueduct
CS2 = carbon disulfide
CUPA = Certified Unified Program Agency
CWA = Clean Water Act
CWAP = Clean Water Action Plan
DC = direct current
DEA = diethanolamine
DFW = Department of Fish and Wildlife
DGS = dry gas scrubber
DHS = Department of Health Services
DPH = Department of Public Heath
DTSC = Department of Toxic Substance Control
DWR = California Department of Water Resources
EA = Environmental Assessment
EAP = Emergency Action Plan
EDV = Electro Dynamic Venturi
EGF = electric generating facility
EIR = Environmental Impact Report
EISA = Energy Independence and Security Act
EJ = Environmental Justice
EJAG = Environmental Justice Advisory Group
EMWD = Eastern Municipal Water District
ERPG = Emergency Response Planning Guidelines
ESP = electrostatic precipitator

EV = electric vehicle
FCCU = fluid catalytic cracking unit
Fe203 = iron oxide
FedOSHA = Federal Occupational Safety and Health Administration
FEMA = Federal Emergency Management Agency
FFV = flexible fuel vehicle
FGT = fuel gas treatment
FHWA = Federal Highway Administration
FR = Federal Register
FUA = Fuel Use Act
gal = gallons
GHG = greenhouse gases
GHGRP = Greehouse Gas Reporting Program
gWh = gigawatt-hour
GWP = global warming potential
H2S = hydrogen sulfide
H2SO4 = sulfuric acid
HAP = hazardous air pollutant
HCFC = hydrochlorofluorocarbon
HCl = hydrochloric acid
HDRD = hydrogeneration-derived renewable diesel
HF = hydrofluoric acid
HMTA = Hazardous Material Transportation Act
HOV = high occupancy vehicle
HRSG = heat recovery steam generation
HSC = Health and Safety Code
HWCL = Hazardous Waste Control Law
HWMP = San Bernardino County's Hazardous Waste Management Plan
ICE = internal combustion engines
IDLH = Immediately Dangerous to Life and Health
inH20 = inches water column
IRP = Integrated Water Resources Plan
IS = Initial Study
kW = kilowatt
kWh = kilowatt-hour
LAA = Los Angeles Aqueduct
LACSD = Los Angeles County Sanitation District
LADWP = Los Angeles Department of Water and Power
LAER = Lowest Achievable Emission Rate
LBGOD = Long Beach Gas and Oil Dept.
LCFS = Low Carbon Fuel Standard
LCP = Local Coastal Program

LEA = Local Enforcement Agencies
LEED = Leadership in Energy and Environmental Design
LEL = lower explosive limit
LEPC = Local Emergency Planning Committee
LOS = level of service
LPG = liquefied petroleum gas
LRP = Local Resources Program
LTCP = Long-Term Conservation Plan
LUP = land use plan
M&I = municipal and industrial
MATES = Multiple Air Toxics Exposure Studies
MCL = Maximum Contaminant Levels
MDAB = Mojave Desert Air Basin
mmBTU or MMBTU = million British Thermal Units
MoO3 = molybdic anhydride
MPO = Metropolitan Planning Organization
MPO = Metropolitan Planning Organizations
MS4s = municipal separate storm sewer systems
MSBACT = Minor Source Best Available Control Technology
MSDS = Material Safety Data Sheet
MTBE = methyl tertiary butyl ether
MW = megawatt
MWD = Metropolitan Water District
N2O = nitrous oxide
Na2CO3 = sodium carbonate
Na2S2O5 = sodium pyrosulfate
Na2SO3 = sodium sulfite
NAAQS = National Ambient Air Quality Standards
NaHSO3 = sodium bisulfite
NaOH = sodium hydroxide
NCP = National Contingency Plan
NECPA = National Energy Conservation Policy Act
NESHAP = National Emission Standard for Hazardous Air Pollutants
NFC = National Fire Code
NFPA = National Fire Protection
NH03 = nitric oxide
NH3 = ammonia
NHTSA = National Highway Traffic and Safety Administration
NIOSH = National Institute for Occupational Safety and Health
NO = nitric oxide
NOP/IS = Notice of Preparation/Initial Study
NOx = oxides of nitrogen

NPDES = National Pollutant Discharge Elimination System
NSCR = non-selective catalytic reduction
NSR = New Source Review
O2 = oxygen
O3 = ozone
OCHCA = Orange County Health Care Agency
OCS = outer continental shelf
OCTA = Orange County Transportation Authority
ODS = ozone depleting substance
OEHA = Office of Environmental Health Hazard Assessment
OES = Office of Emergency Services
OHMS = Office of Hazardous Materials Safety
OPR = Office of Planning and Research
OSHA = Occupational Safety and Health Administration
PAR = Proposed Amended Rule
PAReg = Proposed Amended Regulation
PCU = publicly owned utilities
PEA = Program Environmental Assessment
PEL = permissible exposure limit
PEV = plug-in electric vehicle
PFC = perfluorocarbon
PM = particulate matter
PM10 = particulate matter with an aerodynamic diameter of 10 microns or less
PM2.5 = particulate matter with an aerodynamic diameter of 2.5 microns or less
POTW = publicly-owned treatment works
ppm = parts per million
ppmv = parts per million by volume'
PSD = Prevention of Significant Deterioration
PSM = Process Safety Management
PG&E = Pacific Gas and Electric
PURPA = Public Utilities Regulatory Policies Act
PV = photovoltaic
PVC = polyvinyl chloride
Qfs = qualifying facilities
QSA = Quantification Settlement Agreement
QV = qualified vehicle testers
RCRA = Resource Conservation and Recovery Act
RCTC = Riverside County Transportation Commission
RECLAIM = Regional Clean Air Incentives Market
REL = Reference Exposure Level
RFS = renewable fuel standard
RIN = renewable identification number

RMP = Risk Management Programs

RPS = renewables portfolio standard

RTAC = Regional Target Advisory Committee

RTC = RECLAIM Trading Credit

RTIP = Regional Transportation Improvement Program

RTP = Regional Transportation Plan

RWQCB = Regional Water Quality Control Board

SANBAG = San Bernardino Associated Governments

SCAB = South Coast Air Basin

SCAG = Southern California Association of Governments

SCAQMD = South Coast Air Quality Management District

SCE = Southern California Edison

SCHWMA = Southern California Hazardous Waste Management Authority

SCR = selective catalytic reduction

SCS = sustainable communities strategy

SDG&E = San Diego Gas and Electric

SEA = Supplemental Environmental Assessment

SF6 = sulfur hexafluoride

SGVEWP = San Gabriel Valley Energy Wise Program

SI = spark ignited

SIP = State Implementation Plan

SNCR = selective non-catalytic reduction

SO2 = sulfur dioxide

SO3 = sulfur trioxide

SoCal Gas = San Gabriel Valley Energy Wise Pgram

SOx = oxides of sulfur

SRRE = Source Reduction and Recycling Element

SRU/TGU = sulfur recovery unit/tail gas unit

SSAB = Salton Sea Air Basin

STE = Solar thermal energy

STEL = short-term exposure limits

SWMP = Storm Water Management Plan

SWP = State Water Project

SWPPP = Storm Water Pollution Prevention Plan

SWRCB = State Water Resources Control Board

TDM = Transportation Demand Management

TEA-21 = Transportation Equity Act for the 21_{st} Century

Ti02 = titanium dioxide

TIMP = Transportation Improvement and Mitigation Program

TLVs = Threshold Limit Values

TMCs = Transportation Management Centers

tons/day = tons per day

tpd = tons per day
TRI = Toxic Release Inventory
TSCA = Toxic Substances Control Act
TSS = total suspended solids
TWA = time-weighted average
UEL = upper explosive limt
USC = United States Code
USDOE = United States Department of Energy
USDOT = United States Department of Transportation
USEPA = United States Environmental Protection Agency
USFS = United States Forest Service
V2O5 = vanadium pentoxide
VC = volume-to-capacity
VHT = vehicle hours of travel
VMT = vehicle miles of travel
VOC = Volatile Organic Compounds
WCI = Western Climate Incentive
WDR = waste discharge requirements
WGS = wet gas scrubber