



South Coast Air Quality Management District

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SUBJECT: NOTICE OF COMPLETION AND RECIRCULATION OF A REVISED DRAFT
SUBSEQUENT ENVIRONMENTAL ASSESSMENT AND OPPORTUNITY FOR PUBLIC
COMMENT

PROJECT TITLE: PROPOSED AMENDED RULES 1146 – EMISSIONS OF OXIDES OF NITROGEN FROM
INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM
GENERATORS, AND PROCESS HEATERS; 1146.1 – EMISSIONS OF OXIDES OF
NITROGEN FROM SMALL INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL
BOILERS, STEAM GENERATORS, AND PROCESS HEATERS; 1146.2 – EMISSIONS OF
OXIDES OF NITROGEN FROM LARGE WATER HEATERS AND SMALL BOILERS
AND PROCESS HEATERS; AND PROPOSED RULE 1100 – IMPLEMENTATION
SCHEDULE FOR NOX FACILITIES

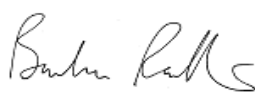
In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and has prepared a Revised Draft Subsequent Environmental Assessment (SEA) for recirculation and to analyze environmental impacts from the project identified above pursuant to its certified regulatory program (SCAQMD Rule 110). A Draft SEA was circulated for comments on April 3, 2018 to May 18, 2018 (referred to herein as the original Draft SEA); however, changes were made to the project description after the comment period ended. SCAQMD staff revised the environmental analysis in the original Draft SEA and prepared a Revised Draft SEA which is now being circulated for an additional public review and comment period. The Revised Draft SEA includes a revised project description and a revised analysis of potential adverse environmental impacts that could be generated from the proposed project. The purpose of this letter and the attached Notice of Completion and Recirculation is to allow public agencies and the public the opportunity to review and comment on the environmental analysis.

This letter, the attached Notice of Completion and Recirculation, and the Revised Draft SEA 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 Revised Draft SEA 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>.

The Revised Draft SEA supersedes the original Draft SEA. Four comment letters were received relative to the original Draft SEA comment period April 3, 2018 to May 18, 2018 and responses have been prepared. The comment letters and responses relative to the original Draft SEA have been included in Appendix G of the Revised Draft SEA. For this reason, reviewers of the Revised Draft SEA will not need to re-submit previous comment letters relative to the original Draft SEA. Responses to comments submitted relative to the Revised Draft SEA will also be prepared and included in the Final SEA. Comments focusing on your area of expertise, your agency's area of jurisdiction, if applicable, or issues relative to the environmental analysis for the proposed project will be accepted during a 45-day public review and comment period beginning Thursday, September 27, 2018 and ending at 5:00 p.m. on Tuesday, November 13, 2018. **Please send any comments relative to the CEQA analysis in the Revised Draft SEA to Ms. Diana Thai (c/o CEQA) at the address shown above.** Comments can also be sent via facsimile to (909) 396-3982 or emailed to dthai@aqmd.gov. Please include the name and phone number of the contact person. Questions regarding the rule language should be directed to Dr. Kalam Cheung at (909) 396-3281 or by email to kcheung@aqmd.gov.

The Public Hearing for the proposed project is scheduled for December 7, 2018. (Note: Public meeting dates are subject to change).

Date: September 26, 2018

Signature: 

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

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

**NOTICE OF COMPLETION AND RECIRCULATION OF A REVISED DRAFT SUBSEQUENT
ENVIRONMENTAL ASSESSMENT AND OPPORTUNITY FOR PUBLIC COMMENT**

Project Title: Proposed Amended Rules 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities

Project Location: The proposed project may affect sites 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: Proposed Amended Rules 1146, 1146.1, and 1146.2 (referred to herein as PARs 1146 series) would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on units with applicable air pollution control equipment and require annual ammonia source testing; and 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1, whichever is earlier. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. The proposed project is estimated to reduce NOx emissions by 0.27 ton per day by January 1, 2023. The Revised Draft SEA identifies potentially significant adverse environmental impacts to air quality during construction and hazards and hazardous materials during operation. Some sites affected by the proposed project may be identified on lists compiled by the California Department of Toxic Substances Control per Government Code Section 65962.5.

Lead Agency:

South Coast Air Quality Management District

Division:

Planning, Rule Development and Area Sources

Revised Draft SEA and all supporting documentation are available at:

SCAQMD Headquarters
21865 Copley Drive
Diamond Bar, CA 91765

or by calling or emailing:

(909) 396-2039 or
PICrequests@aqmd.gov

Revised Draft SEA can also be obtained by accessing SCAQMD's website at:

<http://www.aqmd.gov/home/library/documents-support-material/lead-agency-scaqmd-projects>

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

☒ Los Angeles Times (September 27, 2018)	☒ SCAQMD Mailing List & Interested Parties
☒ SCAQMD Public Information Center	☒ SCAQMD Website
-

Revised Draft SEA Review Period (45 days): September 27, 2018 – November 13, 2018

Scheduled Public Meeting Date(s) (subject to change):

Stationary Source Committee: October 19, 2018, 10:30 a.m.; SCAQMD Headquarters – Conference Room CC8
SCAQMD Governing Board Hearing: December 7, 2018, 9:00 a.m.; SCAQMD Headquarters – Auditorium

The proposed project may have statewide, regional, or areawide significance; therefore, a CEQA scoping meeting was required (pursuant to Public Resources Code Section 21083.9 (a)(2)) and held at the SCAQMD's Headquarters in conjunction with the Public Workshop on February 14, 2018.

Send CEQA Comments to:

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dthai@aqmd.gov

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(909) 396-3982

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Revised Draft Subsequent Environmental Assessment for Proposed Amended Rules 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NO_x Facilities

September 2018

**SCAQMD No. 04022018DT/200811127/070108BAR/032206BAR
State Clearinghouse No: 2016071006/2008011127/2008071014**

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PREFACE

This document is the Revised Draft Subsequent Environmental Assessment (SEA) for Proposed Amended Rules 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters (referred to herein as PARs 1146 series); and Proposed Rule 1100 – Implementation Schedule for NO_x Facilities (PR 1100). A Draft EA was circulated for a 45-day public review and comment period from April 3, 2018 to May 18, 2018 (referred to herein as the original Draft SEA); however, changes were made to the project description after the comment period ended. SCAQMD staff revised the environmental analysis in the original Draft SEA and prepared a Revised Draft SEA which is now being recirculated for an additional public review and comment period. The Revised Draft SEA includes a revised project description and a revised analysis of the potential adverse impacts that could be generated from the proposed project. To facilitate identification of the changes between the original Draft SEA and the Revised Draft SEA, modifications to the document are included as underlined text and text removed from the document is indicated by ~~strikethrough~~. To avoid confusion, minor formatting changes are not shown in underline or strikethrough mode. This Revised Draft SEA supersedes the original Draft SEA.

Four comment letters were received relative to the original Draft SEA public comment period of April 3, 2018 to May 18, 2018 and responses have been prepared. The comment letters and responses relative to the original Draft SEA have been included in Appendix G of this Revised Draft SEA. The Revised Draft SEA has been released for a 45-day public review and comment period from Thursday, September 27, 2018 to Tuesday, November 13, 2018 at 5:00 pm. Comment letters received during the new public comment period from September 27, 2018 to November 13, 2018 relative to the analysis presented in the Revised Draft SEA will be included in an appendix and responded to in the Final SEA.

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CHAPTER 1

EXECUTIVE SUMMARY

Introduction

California Environmental Quality Act

Previous CEQA Documentation

Intended Uses of this Document

Areas of Controversy

Executive Summary

INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977¹ 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 (SSAB) and Mojave Desert Air Basin. In 1977, amendments to the federal Clean Air Act (CAA) included requirements for submitting State Implementation Plans (SIPs) for nonattainment areas that fail to meet all federal ambient air quality standards (CAA Section 172), and similar requirements exist in state law (Health and Safety Code Section 40462). The federal CAA was amended in 1990 to specify attainment dates and SIP requirements for ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), and particulate matter with an aerodynamic diameter of less than 10 microns (PM₁₀). In 1997, the United States Environmental Protection Agency (U.S. EPA) promulgated ambient air quality standards for particulate matter with an aerodynamic diameter less than 2.5 microns (PM_{2.5}). The U.S. EPA is required to periodically update the national ambient air quality standards (NAAQS).

In addition, the California Clean Air Act (CCAA), adopted in 1988, requires the SCAQMD to achieve and maintain state ambient air quality standards for ozone, CO, sulfur dioxide (SO₂), and NO₂ by the earliest practicable date. (Health and Safety Code Section 40910.) The CCAA also requires a three-year plan review, and, if necessary, an update to the SIP. The CCAA requires air districts to achieve and maintain state standards by the earliest practicable date and for extreme non-attainment areas, to include all feasible measures pursuant to Health and Safety Code Sections 40913, 40914, and 40920.5. The term “feasible” is defined in the Title 14 of the California Code of Regulations, Section 15364, as a measure “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.”

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 areas under the jurisdiction of the SCAQMD². Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP³. The AQMP is a regional blueprint for how the SCAQMD will achieve air quality standards and healthful air and the 2016 AQMP⁴ contains multiple goals promoting reductions of criteria air pollutants, greenhouse gases (GHGs), and toxic air contaminants (TACs). In particular, the 2016 AQMP states that both NO_x and volatile organic compounds (VOC) emissions need to be addressed, with the emphasis that NO_x emission reductions are more effective to reduce the formation of ozone and PM_{2.5}. Ozone is a criteria pollutant shown to adversely affect human health and is formed when VOCs react with NO_x in the atmosphere. NO_x is a precursor to the formation of ozone and PM_{2.5}, and NO_x emission reductions are necessary to achieve the ozone standard attainment. NO_x emission reductions also contribute to attainment of PM_{2.5} standards.

In October 1993, the SCAQMD Governing Board adopted Regulation XX – Regional Clean Air Incentives Market (RECLAIM) to reduce NO_x and oxides of sulfur (SO_x) emissions from

¹ The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., Ch. 324 (codified at Health and Safety Code Section 40400-40540).

² Health and Safety Code Section 40460(a).

³ Health and Safety Code Section 40440(a).

⁴ SCAQMD, Final 2016 Air Quality Management Plan, March 2017. <http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp>

facilities. The RECLAIM program was designed to take a market-based approach to achieve emission reductions, as an aggregate. The RECLAIM program was created to be equivalent to achieving emissions reductions under a command-and-control approach, but by providing facilities with the flexibility to seek the most cost-effective solution to reduce their emissions. The market-based approach used in RECLAIM was based on using a supply-and-demand concept, where the cost to control emissions and reduce a facility's emissions would eventually become less than the diminishing supply of NO_x RECLAIM trading credits (RTCs). However, analysis of the RECLAIM program over the long term has shown that the ability to achieve actual NO_x emission reductions has diminished, due to a large amount of RTCs resulting from shutdowns being re-introduced into the market prior to amendments to Rule 2002 in October 2016 to address this issue.

In the 2016 AQMP, control measure CMB-05 - Further NO_x Reductions from RECLAIM Assessment, committed NO_x emission reductions of five tons per day to occur by 2025. The process of transitioning NO_x RECLAIM facilities to a command-and-control regulatory structure will ensure that the affected equipment will meet Best Available Retrofit Control Technology (BARCT) level equivalency as soon as practicable.

The Governor approved Assembly Bill (AB) 617 on July 26, 2017, which addresses non-vehicular air pollution including criteria pollutants and TACs. AB 617 is a companion legislation to approved AB 398, which extends California's cap-and-trade program for reducing GHG emissions from stationary sources. AB 398 requires Air Districts to develop by January 1, 2019 an expedited schedule for the implementation of BARCT by December 31, 2023 for cap-and-trade facilities. A subset of RECLAIM facilities will be subject to the requirements of ABs 617 and 398. To address these requirements, SCAQMD staff completed an analysis of the RECLAIM equipment at each facility, giving a higher priority to older, higher polluting units that need to install retrofit controls. To have all units achieve BARCT level equivalency, it was concluded that command-and-control rules would need to be adopted and/or amended, along with an implementation schedule.

As a result of control measure CMB-05 from the 2016 AQMP and ABs 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NO_x RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. Thus, SCAQMD has begun this transition process by proposing amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters. Proposed Amended Rules (PAR) 1146, 1146.1, and 1146.2 (collectively referred to herein as the PARs 1146 series)-will be is one of the first set of rules to be amended to initiate the transition of equipment from the NO_x RECLAIM program to a command-and-control regulatory structure while achieving BARCT. As a result of the BARCT assessment conducted for PARs 1146 and 1146.1, some units at non-RECLAIM facilities will also be affected and will be required to meet BARCT NO_x emissions equivalency according to the compliance schedule specified in PARs 1146 and 1146.1.

In addition, SCAQMD staff has developed Proposed Rule (PR 1100), an administrative rule which establishes the compliance schedule for the Rule 1146 and 1146.1 units at RECLAIM facilities~~PARs 1146 series facilities exiting the RECLAIM program~~. The compliance schedule for

PARs 1146 and 1146.1 ~~PARs 1146 series~~ will be a ~~three~~^{five}- to ~~four~~^{six}-year period depending on the equipment size, ~~and~~ number of affected units at each facility, and based on how the facility will meet the compliance schedule and NOx emission limits (e.g., burner retrofit, SCR system installation, or equipment replacement). In addition, facilities with multiple units subject to multiple source-specific landing rules (e.g., SCAQMD rules other than the PARs 1146 series) will also be taken into consideration. Implementation of the proposed project is estimated to reduce NOx emissions by ~~0.23–0.27~~ ton per day by January 1, 2023 and it is expected to be achieved by the installation of selective catalytic reduction (SCR) technology/systems and ultra-low NOx burners.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (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 SCAQMD Governing Board, public agencies, and interested parties 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 Section 21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of a negative declaration or 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 SCAQMD Rule 110 – Rule Adoption Procedures to Assure Protection and Enhancement of the Environment. Pursuant to Rule 110 (the rule which implements the SCAQMD's certified regulatory program), the SCAQMD typically prepares an Environmental Assessment (EA) to evaluate the environmental impacts for rule projects proposed for adoption or amendment.

PARs 1146 series and PR 1100 are considered a “project” as defined by CEQA. PARs 1146 series contains amendments that revise existing requirements included in Rules 1146 and 1146.1, as amended in September 2008 and November 2013, and Rule 1146.2 as amended in May 2006.

PARs 1146 series in combination with PR 1100 will transition affected units at NOx RECLAIM facilities to a command-and-control regulatory structure. NOx RECLAIM facilities with equipment subject to PARs 1146 and, 1146.1, ~~and 1146.2~~ will be required to meet the NOx emission limits in these rules in accordance with the implementation schedule outlined in PR 1100. In addition, a subset of units at non-RECLAIM facilities will be required to meet new NOx emission limits according to the compliance schedule specified in PARs 1146 and 1146.1. The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the SCAQMD Governing Board as control measure CMB-05 in the 2016 AQMP and the potential environmental impacts associated with the 2016 AQMP, including CMB-05, were analyzed in the Final Program Environmental Impact Report (Program EIR) certified in March 2017⁵.

⁵ SCAQMD, Final Program Environmental Impact Report for the 2016 Air Quality Management Plan, March 2017.
<http://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects/scaqmd-projects---year-2017>

Analysis of PARs 1146 and 1146.1 indicates that the estimated NOx emission reductions that were originally projected to be achieved as part of the September 2008 amendments to both Rules 1146 and 1146.1 will be greater than originally projected in the September 2008 Final Environmental Assessments (EAs)^{6,7} because additional facilities that were originally subject to the NOx RECLAIM program will now be subject to the NOx emission limits contained in PARs 1146 and 1146.1.

Initial analysis of the baseline inventory for RECLAIM facilities with Rule 1146.2 units estimates NOx emissions to be minimal relative to the emission inventory from Rules 1146 and 1146.1 units, as indicated in Chapter 3, Table 3-1. However, it is important to note that Rule 1146.2 units are smaller units that are exempt from permitting requirements under Rule 219 - Equipment Not Requiring a Written Permit Pursuant to Regulation II. Non-RECLAIM facilities currently register Rule 1146.2 equipment from one up to and including two MMBtu per hour under Rule 222 - Filing Requirements For Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II. RECLAIM facilities are currently exempt from this provision. Additionally, the RECLAIM NOx emissions for combustion sources not requiring a written permit are reported on a quarterly basis as an aggregate sum for these devices. As a result, the permitted Rule 1146.2 universe may not fully represent the actual number of Rule 1146.2 units at RECLAIM facilities because the majority of the Rule 1146.2 units in RECLAIM are not currently registered or permitted with SCAQMD. Therefore, it is difficult to establish a precise inventory of the Rule 1146.2 units at RECLAIM facilities at this time. However, the additional Rule 1146.2 units (permitted and unpermitted) that will transition out of the NOx RECLAIM program and instead meet the NOx emissions limits in PAR 1146.2 were not projected in the May 2006 Final EA⁸. A RECLAIM facility with Rule 1146.2 units will be required to meet the applicable NOx concentration limit as specified in Rule 1146.2 by December 31, 2023. SCAQMD staff will conduct additional BARCT research along with obtaining updated emission inventory data if that is available. If the research shows that BARCT is more stringent so that significant additional NOx emissions reductions can be obtained, then staff will initiate a subsequent rule development process. Implementation of the proposed project is estimated to reduce NOx emissions by ~~0.23~~ 0.27 ton per day by January 1, 2023.

SCAQMD staff has determined that PARs 1146 series and PR 1100 contain new information of substantial importance which was not known and could not have been known at the time: 1) the Final EAs were certified for the September 2008 amendments to Rules 1146 and 1146.1 (referred to herein as the September 2008 Final EAs for Rules 1146 and 1146.1); 2) the Final EA was certified for the May 2006 amendments to Rule 1146.2 (referred to herein as the May 2006 Final EA); and 3) the Final Program EIR was certified for the March 2017 adoption of the 2016 AQMP (referred to herein as the March 2017 Final Program EIR. However, PARs 1146 series is not expected to create new significant effects that were not discussed in the previous September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP.

⁶ Final Environmental Assessment for Proposed Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; SCH No. 2008011127; Certified September 5, 2008.

⁷ Final Environmental Assessment for Proposed Amended Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; SCH No. 2008071014; Certified September 5, 2008.

The September 2008 Final EA for Rule 1146 identified significant adverse environmental impacts in the areas of air quality and hazards and hazardous materials. The analysis in the September 2008 Final EA determined the amendments to Rule 1146 had the potential to create significant adverse hazards and hazardous materials impacts associated with the use and storage of aqueous ammonia. Mitigation measures were identified to minimize the significant, adverse hazards and hazardous materials impacts, but would not reduce the potentially significant impacts to a level of insignificance. No other feasible mitigation measures were identified. As such, mitigation measures were made a condition of the approval of this project. Findings, a Statement of Overriding Considerations, and Mitigation Monitoring Plan were adopted for this project.

The September 2008 Final EA for Rule 1146.1 concluded that September 2008 amendments to Rule 1146.1 would not generate any significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis and no mitigation measures were required by CEQA. Mitigation measures were not made a condition of the approval of this project and a Mitigation Monitoring Plan was not adopted for this project. Findings were not made and a Statement of Overriding Considerations was not adopted for this project.

As with the September 2008 amendments to Rule 1146.1, the May 2006 Final EA for Rule 1146.2 also concluded that May 2006 amendments to Rule 1146.2 would not generate any significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis and no mitigation measures were required by CEQA. Mitigation measures were not made a condition of the approval of this project and a Mitigation Monitoring Plan was not adopted for this project. Findings were not made and a Statement of Overriding Considerations was not adopted for this project.

The March 2017 Final Program EIR for the 2016 AQMP determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste and transportation. More specifically, the March 2017 Final Program EIR evaluated the impacts from installation and operation of additional control equipment and SCR or SNCR equipment potentially resulting in construction emissions increased electricity demand, hazards from additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalysts replacements, as well as changes in traffic patterns and volume. For the entire 2016 AQMP, the analysis concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measure for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia, (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Since significant adverse environmental impacts were identified, mitigation measures were identified and applied. However, the March 2017 Final Program EIR concluded that the 2016 AQMP would have significant and unavoidable adverse environmental impacts even after mitigation measures were identified and applied. As such, mitigation measures were made a

condition of project approval and a Mitigation Monitoring and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was prepared and adopted for this project.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined that will be substantially more severe than what was discussed in the September 2008 Final EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)).

Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

Further, PARs 1146 series and PR 1100 contain new information of substantial importance as they relate to PARs 1146, 1146.1, and 1146.2, and control measure CMB-05. Thus, analysis of the proposed project indicates that the type of CEQA document appropriate for the proposed project is a Subsequent Environmental Assessment (SEA), in lieu of an EA. The SEA is a substitute CEQA document, prepared in lieu of a Subsequent Environmental Impact Report with significant impacts (CEQA Guidelines Section 15162(b)), pursuant to the SCAQMD's Certified Regulatory Program (CEQA Guidelines Section 15251(l); codified in SCAQMD Rule 110). The SEA 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.

Because the new potentially significant adverse effects to hazards and hazardous materials that may result from implementing PARs 1146 and 1146.1 were not analyzed at the project level in the September 2008 Final EAs for Rules 1146 and 1146.1 or the March 2017 Final Program EIR for the 2016 AQMP, and because PAR 1146.2 and PR 1100 contain new information that was not previously considered, the SCAQMD, as lead agency for the proposed project has prepared this SEA with significant impacts pursuant to its Certified Regulatory Program. Because PARs 1146 series and PR 1100 may have statewide, regional or areawide significance, a CEQA scoping meeting is required pursuant to Public Resources Code Section 21083.9(a)(2) and was held at the SCAQMD's Headquarters in conjunction with the Public Workshop on February 14, 2018. One oral, CEQA-related comment was made at the Public Workshop/CEQA scoping meeting relative to PARs 1146 series and PR 1100. The comment and response are included in Appendix F of this Revised Draft SEA. Further, pursuant to CEQA Guidelines Section 15252, since significant adverse impacts have been identified, an alternatives analysis and mitigation measures are required.

~~The~~ A Draft SEA was released and circulated for a 45-day public review and comment period from Tuesday, April 3, 2018 to May 18, 2018 (referred to herein as the original Draft SEA) at 5:00 p.m. However, changes were made to the project description after the comment period ended. SCAQMD staff revised the environmental analysis in the original Draft SEA and prepared this Revised Draft SEA which is now being circulated for an additional 45-day public review and comment period. The Revised Draft SEA includes a revised project description and a revised

analysis of potential adverse environmental impacts that could be generated from the proposed project. This Revised Draft SEA supersedes the original Draft SEA. Four comment letters were received relative to the original Draft SEA during the public comment period from April 3, 2018 to May 18, 2018 and responses have been prepared. The comment letters and responses relative to the original Draft SEA have been included in Appendix G of this Revised Draft SEA. The Revised Draft SEA has been released for a 45-day public review and comment period from September 27, 2018 to November 13, 2018 at 5:00 pm. Comment letters received during the new public comment period of September 27, 2018 to November 13, 2018 relative to the analysis presented in the Revised Draft SEA will be included in an appendix and responded to in the Final SEA.

The September 2008 Final EA for Rule 1146, the September 2008 Final EA for Rule 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP upon which this SEA relies, are available from the SCAQMD's website at:

September 2008 Final EA for Rule 1146: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146.pdf>

September 2008 Final EA for Rule 1146.1: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146-1.pdf>

May 2006 Final EA for Rule 1146.2: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2006/final-ea-for-proposed-amended-rule-1146-2.doc>

March 2017 Final Program EIR for the 2016 AQMP: <http://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects/scaqmd-projects---year-2017>

The above documents may also be obtained by visiting the Public Information Center at SCAQMD Headquarters located at 21865 Copley Drive, Diamond Bar, CA 91765; or by contacting Fabian Wesson, Public Advisor by phone at (909) 396-2039 or by email at PICrequests@aqmd.gov.

Prior to making a decision on the adoption of PARs 1146 series and PR 1100, the SCAQMD Governing Board must review, consider, and certify the Final SEA, including responses to comments, as providing adequate information on the potential adverse environmental impacts that may occur as a result of adopting PARs 1146 series and PR 1100.

PREVIOUS CEQA DOCUMENTATION

This Revised Draft SEA is a comprehensive environmental document that analyzes potential environmental impacts from PARs 1146 series and PR 1100. 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.). Rule 1146 was adopted in September 1988 and amended in January 1989, May 1994, June 2000, November 2000, September 2008, and November 2013. Rule 1146.1 was adopted in October 1990 and was amended July 1992, May 1994, September 2008, and November 2013. Rule 1146.2 was adopted January 1998 and amended January 2005 and May 2006. Several

previous environmental analyses have been prepared that analyzed the past amendments to Rule 1146, 1146.1, and 1146.2. Also, the 2016 AQMP was adopted in March 2017 and an environmental analysis for the entire 2016 AQMP, including control measure CMB-05, was addressed in the March 2017 Final Program EIR. However, because PR 1100 is a new rule, there is no previous CEQA documentation available; but PR 1100 is integrally related to the PARs 1146 series, since PR 1100 simply specifies an implementation schedule for the PARs 1146 and 1146.1 series.

The following summarizes the contents of the CEQA documents prepared for previous versions of Rules 1146, 1146.1, and 1146.2 and for the 2016 AQMP in reverse chronological order and are included for informational purposes. For the CEQA documents that were prepared after January 1, 2000, a link for downloading files from the SCAQMD's website is provided immediately following the summaries. In addition, hardcopies of these CEQA documents can be obtained by submitting a Public Records Act request to the SCAQMD's Public Records Unit.

Final Program Environmental Impact Report for the 2016 Air Quality Management Plan; March 2017 (2016071006): The 2016 AQMP identified control measures and strategies to bring the region into attainment with the revoked 1997 8-hour NAAQS (standard) (80 ppb) for ozone by 2024; the 2008 8-hour ozone standard (75 ppb) by 2032; the 2012 annual PM_{2.5} standard (12 µg/m³) by 2025; the 2006 24-hour PM_{2.5} standard (35 µg/m³) by 2019; and the revoked 1979 1-hour ozone standard (120 ppb) by 2023. The 2016 AQMP consists of three components: 1) the SCAQMD's Stationary, Area, and Mobile Source Control Measures; 2) State and Federal Control Measures provided by the California Air Resources Board; and 3) Regional Transportation Strategy and Control Measures provided by the Southern California Association of Governments. The 2016 AQMP includes emission inventories and control measures for stationary, area and mobile sources, the most current air quality setting, updated growth projections, new modeling techniques, demonstrations of compliance with state and federal Clean Air Act requirements, and an implementation schedule for adoption of the proposed control strategy. A Final Program EIR was prepared for the project which identified potential adverse impacts that may result from implementing the project for the following environmental topic areas: 1) aesthetics; 2) air quality and GHGs; 3) energy; 4) hazards and hazardous materials; 5) hydrology and water quality; 6) noise; 7) solid and hazardous waste; and 8) transportation and traffic. The analysis concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Since significant adverse environmental impacts were identified, an alternatives analysis was required by CEQA and prepared. The March 2017 Final Program EIR concluded that the project would have significant and unavoidable adverse environmental impacts even after mitigation measures were identified and applied. As such, mitigation measures were made a condition of the approval of the project and a Mitigation Monitoring and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was prepared and adopted. The SCAQMD Governing Board certified the Final Program EIR and approved the project on March 3, 2017.

Notice of Exemption From CEQA for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and, Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; November 2013: The November 2013 amendments to Rule 1146 and 1146.1 addressed a SIP approvability issue that was raised by the U.S. EPA regarding the use of source test data and portable analyzers test results to prove a violation of the emission standard. Also included in the November 2013 amendments were the following minor changes: 1) a clarification that Rules 1146 and 1146.1 do not apply to NOx sources subject to the SCAQMD's Regulation XX – RECLAIM; 2) the identification of certain equipment that are not included under boiler or steam generator category; 3) an enhanced description pertaining to the types of operations that would be subject to Rule 1146; 4) a clarification that low fuel usage equipment are only subject to periodic tune-up requirements; and, 5) a prohibition from derating equipment to a level at or below two million British Thermal Units (MMBtu) per hour.

The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1) and SCAQMD staff concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. The project was approved on November 1, 2013 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties. This document can be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default-source/ceqa/notices/notices-of-exemption/2013/par1146noe.pdf>.

Final Environmental Assessment for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; September 2008 (SCH No. 200811127/SCAQMD No. 01308BAR): SCAQMD staff concluded the project would result in significant adverse environmental impacts in the areas of hazards and hazardous materials and air quality. The September 2008 amendments reduced the allowable NOx emission limits for boilers, steam generators and process heaters from 30 parts per million (ppm) to either 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. The September 2008 amendments also added NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes included: 1) establishing a weighted average formula for dual fueled co-fired units; 2) allowing existing units to be de-rated to no less than two MMBtu per hour per unit; 3) requiring compliance with a 30 ppm NOx limit for low fuel usage equipment by January 1, 2015 or burner replacement, whichever occurs later; 4) allowing a later compliance date for health facilities complying with seismic safety requirements; 5) establishing a staged compliance schedule over a multi-year period which varies by equipment size range and unit operation; 6) making the frequency of compliance testing compatible with sources subject to the RECLAIM program for the same equipment size range; and 7) allowing NOx emissions monitoring with a portable analyzer. The SCAQMD prepared a Draft EA, which identified significant adverse environmental impacts for air quality and hazards and hazardous materials. The Draft EA was released for a 45-day public review and comment period from June 13, 2008 to July 29, 2008 and one comment letter was received. The Final EA, including the comment letter and responses to comments, was certified by the SCAQMD Governing Board on September 5, 2008. Findings were made and a Statement of Overriding Considerations was also adopted for this project. This document can be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default->

source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146.pdf.

Final Environmental Assessment for Proposed Amended Rule 1146.1– Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; September 2008 (SCH No. 2008071014/SCAQMD No. 070108BAR):

The September 2008 amendments to Rule 1146.1 further reduced the NO_x emission limits, included new NO_x limits for atmospheric units to be 12 ppm or 0.015 pound per MMBtu, and units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. The amendments also: 1) established a weighted average formula for dual fueled co-fired units; 2) allowed existing units to be de-rated to no less than two MMBtu per hour per unit; 3) made the frequency of compliance testing compatible with RECLAIM sources for the same equipment size range; 4) allowed for monitoring of NO_x and CO emissions with a portable analyzer; 5) for low-fuel usage units, required compliance with a 30 ppm NO_x limit by January 1, 2015 or burner replacement, whichever occurs later; 6) allowed thermal fluid heaters to continue compliance with the 30 ppm NO_x limits; and, 7) allowed a later compliance date for health facilities complying with seismic safety requirements. The SCAQMD prepared a Draft EA, which identified no significant adverse environmental impacts, to evaluate potential adverse impacts from the project. The Draft EA was released for a 30-day public review period from July 2, 2008 to July 31, 2008 and no comments were received. The Final EA was certified by the SCAQMD Governing Board on September 5, 2008. This document can be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146-1.pdf>.

Final Environmental Assessment for Proposed Amended Rule 1146.2– Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; May 2006 (SCAQMD No. 032206BAR):

The May 2006 amendments to Rule 1146.2 were crafted to partially offset the NO_x emission reductions foregone from the previous amendments to Rule 1146.2 that were adopted on January 7, 2005. The amendments required: 1) Type 2 units (equipment with heat input ratings greater than 400,000 Btu per hour) to meet a NO_x emission limit of 20 ppm on or after January 1, 2010; and 2) Type 1 units (equipment with a heat input rating equivalent to or less than 400,000 Btu per hour) to meet a NO_x emission limit of 20 ppm on or after January 1, 2012. Other changes included: 1) providing more detailed specifications for demonstrating compliance with an existing exemption from retrofit requirements for equipment operating less than 9,000 therms per year; 2) clarifying rule applicability; 3) a specific recordkeeping requirement for larger units; 4) enhancing compliance and enforceability; and, 5) improving clarity. The SCAQMD prepared a Draft EA, which identified no significant adverse environmental impacts, to evaluate potential adverse impacts from the project. The Draft EA was released for a 30-day public review period from March 23, 2006 to April 21, 2006 and no comments were received. The Final EA was certified by the SCAQMD Governing Board on May 5, 2006. This document can be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2006/final-ea-for-proposed-amended-rule-1146-2.doc>.

Final Environmental Assessment for Proposed Amended Rule 1146.2– Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; January 2005 (SCAQMD No. 120104KCS):

The January 2005 amendments to Rule 1146.2 extended the compliance date from January 1, 2005 to January 1, 2006 for existing units with a rated heat input greater than one MMBtu per hour but less than or equal to two MMBtu per hour manufactured on

or after January 1, 1992. Specifically, on or after January 1, 2006, no person would be allowed to operate any existing unit with a rated heat input greater than one MMBtu per hour but less than or equal to two MMBtu per hour more than 15 years old based on the date of manufacture, unless the certified NOx emissions are less than or equal to 30 ppm. Further, on or after January 1, 2006, no person would be allowed to operate in the District any unit more than 15 years old, based on the original date of manufacture with a rated heat input greater than 400,000 Btu per hour, but less than or equal to one MMBtu per hour manufactured prior to January 1, 2000 unless the certified NOx emissions are less than or equal to 30 ppm.

The SCAQMD prepared a Draft EA, which identified significant adverse environmental impacts for air quality, to evaluate potential adverse impacts from the project. The Draft EA was released for a 45-day public review period from October 8, 2004 to November 23, 2004 and one comment letter was received. The Final EA, including the comment letter and responses to comments, was certified by the SCAQMD Governing Board on January 7, 2005. Findings were made and a Statement of Overriding Considerations was also adopted for this project. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2005/fea-1146/fea_1146.pdf.

Notice of Exemption From CEQA for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; November 2000: The November 2000 amendments to Rule 1146: 1) reduced the emission limit for gaseous fueled units to 30 ppm NOx; 2) reduced the emission limit for dual-fueled units to 30 ppm NOx or an average of 30 ppm to 40 ppm NOx weighted by fuel use; and, 3) added annual emissions testing requirements and require totalizing fuel meters on all dual-fueled units where operators elect to meet the fuel-weighted average. An air quality benefit of approximately 90 tons per year of NOx was estimated to result from implementation of the November 2000 amendments.

The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1). Because no substantial physical change to the existing setting was anticipated and no additional secondary control was required, the SCAQMD concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. The project was approved on November 17, 2000 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties. This document can also be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default-source/ceqa/notices/notices-of-exemption/2000/noe-rule-1146.doc>.

Final Environmental Assessment for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; June 2000 (SCAQMD No. 000502MK): The SCAQMD prepared a Draft EA, which identified no significant adverse environmental impacts, to evaluate potential adverse impacts from the proposed amendment to Rule 1146. The Draft EA was released for a 30-day public review period from May 1, 2000 to May 31, 2000 and no comments were received. The Final EA was certified by the SCAQMD Governing Board on June 16, 2000. This document can be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2000/final-ea-for-proposed-amended-rule-1146--->

[emissions-of-oxides-of-nitrogen-from-industrial-institutional-and-commercial-boilers-steam-generators-and-process-heaters.doc](#).

Notice of Exemption From CEQA for Proposed Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; January 1998:

The adoption of Rule 1146.2 established NOx emission limits for water heaters and small boilers with a rated heat input between 75,000 and two MMBtu per hour. Rule 1146.2 was estimated to reduce NOx emissions by nine tons per day. Rule 1146.2 was reviewed pursuant to CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts to the environment. The project was approved on January 9, 1998 and a Notice of Exemption was filed with the country clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; May 1994:

The May 1994 amendments to Rule 1146: 1) added a tune-up procedure for natural draft boilers; 2) added a provision to allow permit owners and operators to tune their equipment once per year, instead of twice per year, provided that the equipment is used for six continuous months or less per year; 3) added a provision to exempt units from tune-up requirements provided that they are not in use during the entire calendar year; 4) deleted the Alternate Emission Control Plan (AECPP) provision since rule compliance dates have expired; and 5) extended the applicability of the rule to include solid fuels.

The project was reviewed pursuant to CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts on the environment. Further, SCAQMD staff also determined the project to be categorically exempt from CEQA pursuant to CEQA Guidelines Section 15308 – Actions by Regulatory Agencies for Protection of the Environment and CEQA Guidelines Section 15321 – Enforcement Actions by Regulatory Agencies. The project was approved on May 13, 1994 and a Notice of Exemption was filed with the country clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; May 1994:

The May 1994 amendments to Rule 1146.1: 1) added a tune-up procedure for natural draft boilers; 2) added a provision to exempt units from tune-up requirements provided that they are not in use during the entire calendar year; and 3) extended the applicability of the rule to include solid fuels.

The project was reviewed pursuant to CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts on the environment. Further, SCAQMD staff determined the project to be categorically exempt from CEQA pursuant to CEQA Guidelines Section 15308 – Actions by Regulatory Agencies for Protection of the Environment and CEQA Guidelines Section 15321 – Enforcement Actions by Regulatory Agencies. The project was approved on May 13, 1994 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; July 1992:

The July 1992 amendments to Rule 1146.1: 1) specified test

methods; 2) required written approval of alternative test methods by the California Air Resources Board (CARB) and U.S. EPA; 3) provided a method to convert NO_x concentrations to pounds of NO_x per MMBtus, 4) limited the exemption period during startups and shutdowns to a maximum of six hours; and 5) clarified rule requirements.

The project was reviewed pursuant to District CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts on the environment. The project was approved on July 10, 1992 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; October 1990: The October 1990 amendments to Rule 1146.1 established limits on NO_x emissions from small industrial, institutional, and commercial boilers, steam generators, and process heaters with greater than two, but less than five MMBtu per hour heat input capacity. A “Notice of Intent to File a Determination of No Significant Impacts” (Determination), including the “Initial Study”, was prepared in accordance with state and District CEQA Guidelines. SCAQMD staff determined that no potentially significant impacts to the environment would occur as a result of implementing the project. The Determination was circulated for public review from August 22, 1990 through September 11, 1990 and no comments were received.

Final Supplemental Environmental Impact Report: Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; January 1989 (SCH No. 87110404): Pursuant to CEQA, the SCAQMD prepared a Draft Supplemental Environmental Impact Report (SEIR) for the January 1989 amendments to Rule 1146. The Draft SEIR was a supplement to the March 1988 Final EIR prepared for Rule 1146 (SCH No. 87110404) and was circulated for a 45-day public review and comment period. Findings were made and a Statement of Overriding Considerations was adopted for the project. The Final SEIR was certified by the SCAQMD Governing Board on January 6, 1989.

Final Environmental Impact Report for Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; September 1988 (SCH No. 87110404): Pursuant to CEQA, the SCAQMD prepared a Draft Environmental Impact Report (EIR) for the September 1988 adoption of Rule 1146. The Draft EIR for Rule 1146 and was circulated for a 45-day public review. Findings were made and a Statement of Overriding Considerations was adopted for the project. The Final EIR was certified by the SCAQMD Governing Board on September 9, 1988.

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 Section 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 Revised Draft SEA is intended to: a) provide the SCAQMD Governing Board and the 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 Section 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 SEA 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.

In addition to the SCAQMD's Governing Board which will consider the SEA for PARs 1146 series and PR 1100 in their decision-making, the CARB, a state agency, and the U.S. EPA, a federal agency, will be reviewing PARs 1146 series and PR 1100 and all supporting documents, including the SEA, as part of the process for considering the inclusion of PARs 1146 series and PR 1100 into the SIP. Moreover, PARs 1146 series and PR 1100 is not subject to any other related environmental review or consultation requirements.

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 that must comply with the requirements in PARs 1146 series and PR 1100, they could possibly rely on this SEA during their decision-making process. Similarly, other single purpose public agencies approving projects that utilize compliant equipment subject to PARs 1146 series and PR 1100 may rely on this SEA.

AREAS OF CONTROVERSY

CEQA Guidelines Section 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, concerns regarding PARs 1146 series and PR 1100 were expressed by representatives of industry and environmental groups, either in public meetings or in written comments, which are highlighted in Table 1-1.

Table 1-1
Areas of Controversy

Areas of Controversy	Topics Raised by the Public	SCAQMD Evaluation
Compliance Dates	RECLAIM facility stakeholders raised concerns over the ability to comply with the proposed compliance dates in PARs 1146 series.	SCAQMD proposes a tiered approach to the compliance dates (75 percent compliance by January 1, 2021 and 100 percent compliance by January 1, 2022 <u>or by January 1, 2023 for replacement units</u>) to lessen the financial impact to businesses and consumers. In addition, units that are subject to Rules 1146 and 1146.1 have been grouped together in the compliance schedule to allow facilities to decide which units they can demonstrate compliance with by earlier (January 1, 2021). Thus, providing them more flexibility for demonstrating compliance. SCAQMD is proposing to extend the compliance date to submit a complete permit application by 12 months after the date of rule adoption. <u>In addition, certain units will be allowed 15 years after the date of rule adoption or during burner replacement to meet the applicable NOx emissions limit.</u>
New Source Review (NSR)	The availability of Emission Reduction Credits (ERCs) for NSR events	~~RECLAIM Facilities with a Potential to Emit (PTE) of less than four tons per year will have access to the SCAQMD's internal bank for any projects that require offsets under Regulation XIII – NSR. The NSR issues will be resolved for facilities with a PTE greater than or equal to four tons per year. For this reason, PARs 1146 series and PR 1100 will only allow facilities with a PTE of less than four tons per year to exit the RECLAIM program. Staff acknowledges that rulemaking regarding the transition has many complexities. However, staff has found it necessary to continue with the approach of amending command-and-control NOx rules concurrently with addressing NSR issues. The reason for this approach is to avoid delay in adopting implementation schedules for BARCT to give facilities adequate time to comply with command-and-control NOx emission limits. Resolving NSR is a significant issue as it requires involvement and approval from U.S. EPA. In the interim, facilities have two options. A facility that receives an initial determination notification can remain in RECLAIM and if there are emission increases that would trigger a New Source Review event, the facility would comply with RECLAIM NSR. Staff is committed to not exit facilities until the NSR issues are resolved. If however, a facility elects to exit before NSR issues are resolved if they had an emissions increase that would trigger a New Source Review event, the facility would need to purchase offsets in the open market.~~
Monitoring, Reporting and Recordkeeping (MRR) Requirements for Title V Facilities	The timeline for potentially eliminating some RECLAIM-specific MRR requirements	For Title V facilities, the U.S. EPA public review process is triggered by modifications on monitoring and recordkeeping requirements. The SCAQMD is committed to re-evaluate monitoring and recordkeeping requirements for Title V facilities. Staff is recommending that Title V facilities ~~will~~ maintain existing monitoring and recordkeeping requirements while the transition process proceeds.

Pursuant to CEQA Guidelines Section 15131(a), “[e]conomic or social effects of a project shall not be treated as significant effects on the environment.” CEQA Guidelines Section 15131(b) states further, “[e]conomic or social effects of a project may be used to determine the significance of physical changes caused by the project.” Physical changes that may be caused by PARs 1146 series and PR 1100 have been evaluated in Chapter 4 of this Revised Draft SEA. No direct or indirect physical changes resulting from economic or social effects have been identified as a result of implementing PARs 1146 series and PR 1100.

To date, no other controversial issues relevant to the CEQA analysis were raised as a part of developing the proposed project.

EXECUTIVE SUMMARY

CEQA Guidelines Section 15123 requires a CEQA document to include a brief summary of the proposed actions and their consequences. In addition, areas of controversy must also be included in the executive summary (see preceding discussion). This Revised Draft SEA 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; and various appendices. The following subsections briefly summarize the contents of each chapter.

Summary of Chapter 1 – Executive Summary

Chapter 1 includes an introduction of the proposed project and 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 four chapters that comprise this SEA.

Summary of Chapter 2 - Project Description

SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at facilities that are currently subject to facility permit requirements per SCAQMD Regulation XX – RECLAIM for NO_x to instead be subject to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI. As such, SCAQMD staff has begun this process by proposing amendments to Rules 1146, 1146.1, and 1146.2 (e.g., PARs 1146 series) and to adopt PR 1100. PARs 1146 series and PR 1100 reflects the proposed project which is a culmination of recommendations made throughout the public engagement process including six~~three~~ working group meetings held at SCAQMD headquarters in Diamond Bar on November 30, 2017, January 16, 2018, ~~and~~ March 7, 2018, April 12, 2018, August 2, 2018, and August 29, 2018. The working group is composed of representatives from the manufacturers, trade organizations, permit stakeholders, businesses, environmental groups, public agencies, consultants, and other interested parties. In addition, staff also discussed concepts for PARs 1146 series and PR 1100 at the RECLAIM working group meetings held on July 13, 2017, September 14, 2017, October 12, 2017, January 11, 2018, February 8, 2018, ~~and~~ March 8, 2018, April 12, 2018, June 14, 2018, July 12, 2018, and September 13, 2018. A Public Workshop and CEQA Scoping Meeting was held February 14, 2018. After changes were made to the proposed project evaluated in the original Draft SEA, another Public Workshop was held on September 20, 2018. PARs 1146 series and PR 1100 would require equipment at RECLAIM facilities that are not subject to a Regulation XI rule to meet current NO_x emission limits and demonstrate BARCT NO_x emissions equivalency, and transition from RECLAIM to an equipment-based command-and-

control regulatory structure. PARs 1146 series would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on units with applicable air pollution control equipment and require annual ammonia source testing; and 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. 1) expand the applicability to include units that were not previously required to comply with Rules 1146 and 1146.1 because they were in the NOx RECLAIM program; 2) require RECLAIM facilities to submit a permit application within 12 months of the date of rule adoption for each unit that does not currently meet the NOx concentration limits in Rules 1146 and/or 1146.1; 3) require the affected equipment to meet the applicable NOx concentration limit for all Rule 1146 and Rule 1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146 or Rule 1146.1 units to notify the Executive Officer which unit(s) will be replaced; and 5) require RECLAIM facilities with Rule 1146.2 units to meet NOx emission limits by December 31, 2023 if a more stringent BARCT limit is not applicable. PR 1100 is an administrative rule which establishes the compliance schedule for facilities exiting the RECLAIM program and allows facilities with Rule 1146/1146.1 units until January 1, 2022 to retrofit all existing units and until January 1, 2023 to replace any existing units, upon notification to the Executive Officer. Implementation of the proposed project is estimated to reduce NOx emissions by 0.23-0.27 ton per day by January 1, 2023. Other minor changes are also proposed for clarity and consistency throughout the rules. The analysis of the proposed project in the Revised Draft SEA indicates that while reducing NOx emissions is an environmental benefit, secondary significant adverse environmental impacts are also expected for the topic areas of air quality and hazards and hazardous materials.

A copy of PARs 1146, 1146.1, and 1146.2, and PR 1100 can be found in Appendix A of this Revised Draft SEA.

Summary of Chapter 3 - Existing Setting

Pursuant to the CEQA Guidelines Section 15125, Chapter 3 – Existing Setting includes a description of the environmental topics areas as being potentially adversely affected by the proposed project. As previously explained, the proposed project is a revision to the previously approved projects that were analyzed in the September 2008 Final EAs for Rules 1146 and 1146.1 and May 2006 Final EA for Rule 1146.2. The September 2008 Final EA for Rule 1146 concluded that significant adverse air quality and hazards and hazardous materials impacts would occur. However, all other environmental topic areas analyzed in the September 2008 Final EA for Rule 1146 were shown to have less than significant or no significant impacts. Both the September 2008 Final EA for Rule 1146.1 and the May 2006 Final EA for Rule 1146.2 concluded that no significant adverse environmental impacts would occur not from the respective projects. Since the analysis of the proposed project indicates that additional potentially significant adverse air quality and hazards and hazardous materials impacts will occur, the focus of the analysis in this Revised Draft SEA is limited to the environmental topics of air quality and hazards and hazardous materials. The

following discussion briefly highlights the existing setting for the topics of air quality and hazards and hazardous materials.

Air Quality

Air quality in the area of the SCAQMD's jurisdiction has shown substantial improvement over the last two decades. Nevertheless, some federal and state air quality standards are still exceeded frequently and by a wide margin. Of the NAAQS established for seven criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide, PM10 and PM2.5), the area within the SCAQMD's jurisdiction is only in attainment with the NAAQS for carbon monoxide, sulfur dioxide, and nitrogen dioxide. Chapter 3 provides a brief description of the existing air quality setting for each criteria pollutant, as well as the human health effects resulting from exposure to each criteria pollutant.

Hazards and Hazardous Materials

The 2016 AQMP contains control measures intended to improve overall air quality; however, the implementation of some control measures, such as CMB-05, may result in adverse hazards and hazardous materials impacts, either directly or indirectly. 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 Basin in large quantities via all modes of transportation including rail, highway, water, air, and pipeline. 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, a number of federal, state, and local laws have been enacted to regulate the use, storage, transportation, and management of hazardous materials and wastes. Chapter 3 discusses the existing hazards and hazardous materials setting.

Summary of Chapter 4 - Environmental Impacts

CEQA Guidelines Section 15126(a) requires a CEQA document to 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. In addition, CEQA Guidelines Section 15126(b) requires a CEQA document to identify the significant environmental effects that cannot be avoided if the proposed project is implemented. CEQA Guidelines Section 15126(c) also requires a CEQA document to consider and discuss the significant irreversible environmental changes that would be involved if the proposed project is implemented. Further, CEQA Guidelines Section 15126(e) requires a CEQA document to consider and discuss mitigation measures proposed to minimize the significant effects. Finally, CEQA Guidelines Section 15130 requires a CEQA document to discuss whether the proposed project has cumulative impacts. Chapter 4 considers and discusses each of these requirements.

Potential Environmental Impacts Found To Be Significant

Air quality from construction activities and hazards and hazardous materials are the only environmental topic areas that have been identified in this Revised Draft SEA as having potentially significant adverse impacts if the proposed project is implemented. These environmental topic areas are analyzed in Chapter 4.

Potential Environmental Impacts Found Not To Be Significant

Because this SEA is a subsequent CEQA document to the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP, this SEA relies on the conclusions reached in these documents as evidence for environmental areas where impacts were found not to be significant. All of these previous CEQA documents reviewed approximately 17 environmental topic areas and analyzed whether the respective projects would create potentially significant adverse impacts. While the analyses in the September 2008 Final EA for 1146.1 and May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic area, the analysis in the September 2008 Final EA for Rule 1146 identified two environmental topic areas as having significant adverse environmental impacts: 1) air quality; and 2) hazards and hazardous materials.

Also, the analysis in the March 2017 Final Program EIR for the 2016 AQMP concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. It is important to note, however, that for these environmental topic areas, not all of the conclusions of significance are applicable to this currently proposed project, PARs 1146 series and PR 1100. Please see Chapter 4, Table 4-14, for a summary of the significant and unavoidable adverse environmental impacts identified in the March 2017 Final Program EIR and which ones apply to the proposed project.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined that will be substantially more severe than what was discussed in the September 2008 Final EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)). Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

By preparing a SEA for the proposed project, since the topics of air quality and hazards and hazardous materials are the only environmental topic areas that would be affected by PARs 1146

series and PR 1100, no other environmental topic areas have been evaluated in this SEA. Thus, the conclusions reached in this Revised Draft SEA are consistent with the conclusions reached in the previously certified CEQA documents (e.g., the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP) that aside from the topics air quality during construction and hazards and hazardous materials, there would be no other significant adverse effects from the implementation of the proposed project. Thus, the proposed project would have no significant or less than significant direct or indirect adverse effects on the following environmental topic areas:

- aesthetics
- air quality during operation
- agriculture and forestry resources
- biological resources
- cultural resources
- energy
- geology and soils
- hydrology and water quality
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- solid and hazardous waste
- transportation and traffic

The September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP can be found using the links referenced in Chapter 2.

Other CEQA Topics

CEQA documents are also required to consider and discuss the potential for growth-inducing impacts (CEQA Guidelines Section 15126(d)) and to explain and make findings about the project's relationship between short-term and long-term environmental goals. (CEQA Guidelines Section 15065(a)(2).) Additional analysis confirms that the 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. Further, implementation of the proposed project is not expected to achieve short-term goals to the disadvantage of long-term environmental goals.

Summary Chapter 5 - Alternatives

CEQA Guidelines Section 15126(e) requires a CEQA document to consider and discuss alternatives to the proposed project. Five alternatives to the proposed project are summarized in Table 1-2: 1) Alternative A - No Project; 2) Alternative B - Compliance Deadline Extension; 3) Alternative C - 100% of Units by January 1, 2021; 4) Alternative D - All Ultra-Low NO_x Burners; and 5) Alternative E — NO_x RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits ~~Lowering Limit for ≥ 40 and < 75 MMBtu/hr.~~ Table 1-3 shows the emission factors relevant to Rules 1146 and 1146.1, which have been extracted from Rule 2002 - Allocations for Oxides of Nitrogen (NO_x) and Oxides of Sulfur (SO_x) Emission Factor Table 1 and 3. Pursuant to the requirements in CEQA Guidelines Section 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 air quality and hazards and hazardous materials from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 1-4. Aside from potentially significant adverse impacts to air quality during construction and hazards and hazardous materials from the catastrophic failure of an aqueous ammonia tank, 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 achieving NO_x emission reductions and the secondary adverse environmental impacts that may occur due to activities associated with construction and the storage of hazardous materials associated with operating air pollution control equipment (e.g., SCRs) while meeting the overall objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 1-2
Summary of the Proposed Project and Alternatives

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NO _x RECLAIM facilities transitioning to command-and-control regulatory structure)	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 <i>*If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)</i>	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm			
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm			
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm			
1146	I	≥ 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Natural Gas	5 ppm or 0.0062 lb/MMBtu			
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NO _x limit >12 ppm (excluding Thermal Fluid Heaters)	Gaseous Fuel (excluding Landfill or Digester Gas)	59 ppm or 0.006244 lb/MMBtu			
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NO _x limit <12 ppm	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	III	≥ 5 and < 20 MMBtu/hr (Fire-tube boilers only) (excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	III	≥ 5 and < 20 MMBtu/hr (Excluding Fire-tube boilers)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu			
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu			
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	1230 ppm, 15 years after the date of rule adoption by January 1, 2022 or when 50 percent or more of the unit's burners are replaced, whichever is earlier occurs later			
1146	-	≥ 5 MMBtu/hr Thermal Fluid Heaters	Natural Gas	12 ppm or 0.015 lb/MMBtu			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu			

***Note: Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factor Tables 1 and 3 and are shown in Table 1-3.

1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)	Natural Gas	9 ppm or 0.011 lb/MMBtu				
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later				
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023	-	No Change	No Change	
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule	-	Compliance deadline would be extended by one year	Compliance deadline would be shortened by one year for 25% of units	

Table 1-2
Summary of the Proposed Project and Alternatives (continued)

<u>Rule No.</u>	<u>Group No.</u>	<u>Heat Input or Equipment Type</u>	<u>Fuel Type</u>	<u>Proposed Project</u>		<u>Alternative A: No Project</u>	<u>Alternative B: Compliance Deadline Extension</u>	<u>Alternative C: 100% of units by January 1, 2021</u>
<u>1146.1</u>	=	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters)</u>	<u>Natural Gas</u>	<u>9 ppm or 0.011 lb/MMBtu</u>	<u>75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023</u>	<u>See Rule 2002 Emission Factor, Table 1 and 3**</u>	<u>75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023</u>	<u>100% of units by January 1, 2021</u>
<u>1146.1</u>	=	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers)</u>	<u>Natural Gas</u>	<u>7 ppm or 0.0085 lb/MMBtu</u>				
<u>1146.1</u>	=	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015 lb/MMBtu</u>				
<u>1146.1</u>	=	<u>Low Fuel Usage (≤ 18,000 therms/year)</u>	<u>Any Fuel</u>	<u>12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier</u>	<u>*If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)</u>			
<u>1146.2</u>	=	<u>≤ 2 MMBtu/hr</u>	<u>Natural Gas</u>	<u>30 ppm, unless a more stringent limit is applicable, by December 31, 2023</u>		=	<u>No Change</u>	<u>No Change</u>
<u>1100</u>	=	<u>Rule 1146 and 1146.1 Units only</u>	=	<u>Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule</u>		=	<u>Compliance deadline would be extended by one year</u>	<u>Compliance deadline would be shortened by one year for 25% of units</u>

**Table 1-2:
Summary of the Proposed Project and Alternatives (continued~~Concluded~~)**

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NO _x RECLAIM facilities transitioning to command-and-control regulatory structure)		Alternative D: All Ultra-Low NO _x Burners	Alternative E: ~~Lowering Limit for NO_x RECLAIM Facilities~~ Transitioning to Command-and-Control Regulatory Structure at Current Limits ≥ 40 and < 75 MMBtu/hr
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the <u>cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility</u> by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 <i>*If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at > 20 ppm (these units must meet 12 ppm by January 1, 2022)</i>	No Change	No Change
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146	I	≥ 75 MMBtu/hr (~~excluding Thermal Fluid Heaters~~)	Natural Gas	5 ppm or 0.0062 lb/MMBtu		9 ppm or 0.011 lb/MMBtu; 75% of units by January 1, 2021 and 100% by January 1, 2022	No Change
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NO _x limit > 12 ppm (~~excluding Thermal Fluid Heaters~~)	Gaseous Fuel (excluding Landfill or Digester Gas)	~~59~~ ppm or 0.006244 lb/MMBtu		9 ppm or 0.011 lb/MMBtu No Change No Change	9 ppm or 0.011 lb/MMBtu 5 ppm for units > 40 MMBtu/hr No Change
<u>1146</u>	<u>II</u>	> 20 and < 75 MMBtu/hr with an existing NO _x limit < 12 ppm	Gaseous Fuel (<u>excluding Landfill or Digester Gas</u>)	<u>7 ppm or 0.0085 lb/MMBtu</u>			
1146	III	≥ 5 and < 20 MMBtu/hr (<u>Fire-tube boilers only</u>) (~~excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr~~)	Gaseous Fuel (excluding Landfill or Digester Gas)	<u>7 ppm or 0.0085 lb/MMBtu</u>		No Change	No Change
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146	-	Low Fuel Usage ($\leq 90,000$ therms/year)	Any Fuel	~~1230~~ ppm, 15 years after the date of rule adoption by January 1, 2022 or when 50 percent or more of the unit's burners are replaced, whichever is earlier ~~occurs later~~		No Change	No Change
<u>1146</u>	<u>-</u>	≥ 5 MMBtu/hr <u>Thermal Fluid Heaters</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015 lb/MMBtu</u>		<u>30 ppm or 0.037 lb/MMBtu</u>	<u>30 ppm or 0.037 lb/MMBtu</u>
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change

**Table 1-2:
Summary of the Proposed Project and Alternatives (concluded)**

<u>Rule No.</u>	<u>Group No.</u>	<u>Heat Input or Equipment Type</u>	<u>Fuel Type</u>	<u>Proposed Project</u>		<u>Alternative D: All Ultra-Low NOx Burners</u>	<u>Alternative E: NOx RECLAIM Facilities Transitioning to Command- and-Control Regulatory Structure at Current Limits</u>
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu	<u>75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023</u> <u>*If the unit is located at a non- RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)</u>	No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)	Natural Gas	9 ppm or 0.011 lb/MMBtu		No Change	<u>9 ppm or 0.011 lb/MMBtu</u> No Change
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers)</u>	<u>Natural Gas</u>	<u>7 ppm or 0.0085 lb/MMBtu</u>		<u>9 ppm or 0.011 lb/MMBtu</u>	
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015 lb/MMBtu</u>		<u>30 ppm or 0.037 lb/MMBtu</u>	<u>30 ppm or 0.037 lb/MMBtu</u>
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	<u>12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier</u> <u>30 ppm by January 1, 2022 or burner replacement, whichever occurs later</u>		No Change	No Change
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		No Change	No Change

Table 1-3
RECLAIM NO_x Emission Factors^{1,2}

Rule No.:	Heat Input	Fuel Type	Year 2000 (Tier 1) Ending NO _x Emission Factor (lbs)	Fuel Throughput Units
1146/1146.1	> 2 MMBtu/hr	Natural Gas	47.57	Mmcf
1146/1146.1	> 2 MMBtu/hr	LPG, Propane, Butane	4.26	1,000 gallons
1146/1146.1	> 2 MMBtu/hr	Diesel Light Dist. (0.05% Sulfur)	6.21	1,000 gallons
1146/1146.1	> 2 MMBtu/hr	Refinery Gas	49.84	Mmcf
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	Natural Gas	39.46	Mmcf
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	Refinery Gas	41.34	Mmcf
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	LPG, Propane, Butane	3.53	1,000 gallons
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	Diesel Light Dist. (0.05% Sulfur)	5.15	1,000 gallons
1146	≥ 5 MMBtu/hr	Natural Gas	47.75	Mmcf
1146	≥ 5 MMBtu/hr	Refinery Gas	50.03	Mmcf
1146	≥ 5 MMBtu/hr	LPG, Propane, Butane	4.28	1,000 gallons
1146	≥ 5 MMBtu/hr	Diesel Light Dist. (0.05% Sulfur)	6.23	1,000 gallons
1146	< 90,000 Therms	Natural Gas	47.75	Mmcf
1146	< 90,000 Therms	Refinery Gas	50.03	Mmcf
1146	< 90,000 Therms	LPG, Propane, Butane	4.28	1,000 gallons
1146	< 90,000 Therms	Diesel Light Dist. (0.05% Sulfur)	6.23	1,000 gallons
1146.1	< 18,000 Therms	Natural Gas	39.46	Mmcf
1146.1	< 18,000 Therms	Refinery Gas	41.34	Mmcf
1146.1	< 18,000 Therms	LPG, Propane, Butane	3.53	1,000 gallons
1146.1	< 18,000 Therms	Diesel Light Dist. (0.05% Sulfur)	5.15	1,000 gallons
1146/1146.1	2 to 20 MMBtu/hr	Any	12 ppm or 0.015 lb/MMBtu	
1146	>20 MMBtu/hr	Any	9 ppm or 0.010 lb/MMBtu	

Note:

1. Some units that began allocations pursuant to Rule 2002(c)(1) may have higher emission factors; however the units met BACT limits effective at the time of installation.
2. Facilities were required to have either met the emission factors for their units or purchased RECLAIM trading credits (RTCs) for compliance.
3. mmcf = million cubic feet

Table 1-4
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra-Low NOx Burners	Alternative E: ~~Lowering Limit for ≥ 40 and < 75 MMBtu/hr NOx RECLAIM~~ Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
Air Quality	Expected to result in NOx emission reductions of ~~0.23~~ <u>0.27</u> ton per day by January 1, 2023. Affected RECLAIM facilities will transition to a command-and-control regulatory structure ~~and all units will meet BARCT level equivalency.~~ <u>Certain non-RECLAIM facilities will meet NOx emission limits during replacement or within 15 years of the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at >20 ppm must meet 12 ppm by January 1, 2022. All units will meet BARCT NOx emissions equivalency from the implementation of command-and control regulatory structure.</u>	No new NOx emission reductions will be achieved. RECLAIM facilities would not transition to a command-and control regulatory structure and all <u>(including some non-RECLAIM)</u> units would not meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project except the reductions would be delayed by one year. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all <u>(including some non-RECLAIM)</u> units will meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project, but emissions would be achieved sooner (by January 1, 2021). Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units <u>(including some non-RECLAIM)</u> will meet BARCT level equivalency.	Expected to result in lesser NOx emission reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure. Some facilities would not meet BARCT level equivalency.	Expected to result in ~~less more~~ NOx emissions reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and control regulatory structure, ~~but and units will be equal to or more stringent than would not reach~~ <u>BARCT level equivalency.</u>
Significance of Air Quality Impacts	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems.	Not Significant: This would not result in an exceedance of SCAQMD's regional air quality CEQA significance threshold for NOx. The SCAQMD will not achieve any emissions reductions; thus, attainment for the SCAQMD for ozone is unlikely to occur.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but with a delay in the operational benefit.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but achieves the operational benefits sooner.	Not Significant: This would result in an amount that is less significant than the proposed project and would not exceed SCAQMD's regional air quality CEQA significance threshold for NOx.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx. ~~Due to the construction of additional SCR systems to meet the NOx emission limits, the impacts are at an amount that is less more significant than the proposed project and NOx emissions reductions would be less than the proposed project, but with more operational benefits.~~

Table 1-4
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (Concluded)

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra-Low NOx Burners	Alternative E: NOx RECLAIM Facilities Transitioning to Command-and- Control Regulatory Structure at Current Limits
Significance of Hazards and Hazardous Materials Impacts	Significant: To operate, SCR systems require ammonia. Ammonia is considered a hazardous material. At two ³² facilities, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors would result in significant impacts.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. <u>The number of affected facilities would be the same as the proposed project.</u> The level of significance in this alternative is equivalent to the amount in the proposed project.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. <u>The number of affected facilities would be the same as the proposed project.</u> The level of significance in this alternative is equivalent to the amount in the proposed project.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. <u>All facilities with affected units would need to retrofit with ultra-low NOx burners; thus, n</u> No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. <u>Less stringent NOx emission limits would result in fewer affected facilities constructing SCR systems; thus, a fewer number of ammonia storage tanks would be needed.</u> However, depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance and- thus still result in significant impacts, but at an equivalent amount of the proposed project. <u>It is estimated four facilities would be affected from this alternative. Additional facilities would be subject to the lower NOx emission limit. As a result, the construction of more SCR systems and ammonia storage tanks would occur. The significance is greater than the amount in the proposed project.</u>

CHAPTER 2

PROJECT DESCRIPTION

Project Location

Project Background

Project Objectives

Project Description

Summary of Affected Equipment

PROJECT LOCATION

PARs 1146 series and PR 1100 applies to a RECLAIM facility with any unit subject to Rules 1146, 1146.1, and 1146.2. The proposed project will begin the process of transitioning equipment under RECLAIM to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air 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 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. A 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).

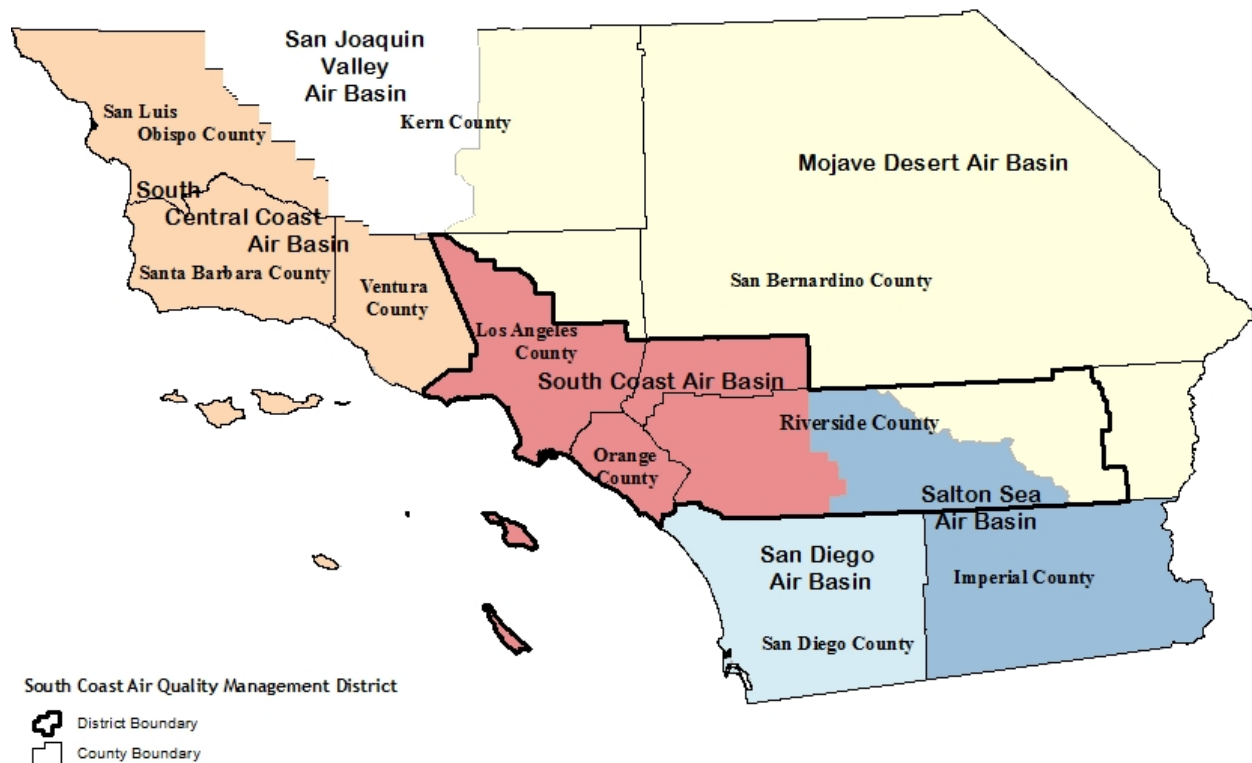


Figure 2-1
Southern California Air Basins

PROJECT BACKGROUND

Rules 1146, 1146.1, and 1146.2 impose NO_x emission limits on various sizes of boilers, steam generators, and process heaters. Rule 1146 applies to boilers, steam generators, and process heaters used in industrial, institutional, and commercial operations, with a rated heat input capacity greater than or equal to five MMBtu per hour. However, Rule 1146 does not regulate NO_x emissions from: 1) boilers operated at electric utilities to generate electricity; 2) boilers and process heaters with a rated heat input capacity greater than 40 MMBtu per hour that are used in petroleum refineries and; and 3) sulfur plant reaction boilers. Rule 1146 defines three groups (Group I, Group II, and Group III) of units burning natural gas or gaseous fuels. The current NO_x emission limits in Rule 1146 vary by the rated heat input (Group number) ~~and the number of units at a facility~~. For example, a Group I unit includes any unit burning natural gas with a rated heat input greater than or equal to 75 MMBtu per hour, excluding thermal fluid heaters, and is required to meet a NO_x emission limit of five ppm or 0.0062 pound per MMBtu by January 1, 2013. A Group II unit includes any unit burning gaseous fuels, excluding digester and landfill gases, and thermal heaters, with a rated heat input less than 75 MMBtu per hour and greater than or equal 20 MMBtu per hour, and is required to meet a NO_x emission limit of nine ppm or 0.011 pound per MMBtu. A minimum of 75 percent of Group II units (by heat input) were required to meet the NO_x emission limit by January 1, 2012 and 100 percent were required to meet the NO_x emission limit by January 1, 2014. Group III units include any unit burning gaseous fuels, excluding digester and landfill gases, and thermal fluid heaters with a rated heat input less than 20 MMBtu per hour and greater than or equal to five MMBtu per hour and all units operated at schools and universities greater than or equal to five MMBtu per hour. Group III units are also required to meet a NO_x emission limit of nine ppm or 0.011 pound per MMBtu with 75 percent or more units (by heat input) meeting the limit by January 1, 2013 and 100 percent meeting the limit by January 1, 2015. Rule 1146 also requires any units fired on non-gaseous fuels, landfill gas, or digester gas to meet a NO_x emission limits of 40 ppm, 25 ppm, or 15 ppm, respectively. Finally, atmospheric units are required to meet a 12 ppm or 0.015 pound per MMBtu NO_x emission limit.

Rule 1146.1 was adopted in October 1990 and established NO_x emission limits for smaller units with a rated heat input capacity greater than two MMBtu per hour and less five MMBtu per hour. Similar to Rule 1146, units using landfill gas or digester gas are also required to meet a NO_x emission limit of 25 ppm or 15 ppm, respectively. Under Rule 1146.1, atmospheric units are also required to meet a 12 ppm NO_x emission limit and all other units fired on natural gas would need to meet a nine ppm or 0.011 pound per MMBtu NO_x emission limit.

In September 2008, Rules 1146 and 1146.1 were amended to obtain NO_x emission reductions by lowering the applicable NO_x emission limits for various equipment, fuel and burner types. In November 2013, Rules 1146 and 1146.1 were amended to clarify that source test results showing emissions in excess of rule limits are considered a rule violation and allow diagnostic emissions checks for boiler maintenance purposes.

In January 1998, Rule 1146.2 was adopted to reduce NO_x emissions from small boilers and large water heaters with a rated heat input capacity of less than or equal two MMBtu per hour. Rule 1146.2 included an exemption for units used in recreational vehicles and units subject to SCAQMD Rule 1121 - Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters. Initially, the Rule 1146.2 required new water heaters, boilers, or process heaters with a rated heat input capacity less than or equal to 400,000 Btu per hour (also known as Type 1 units) to meet a NO_x emission limit of 55 ppm (at three percent oxygen (O₂), dry) or 40 nanograms (ng) per Joule

(J) of heat output. New water heaters, boilers, or process heaters with a rated heat input capacity greater than 400,000 Btu per hour and less than or equal to two MMBtu per hour (or Type 2 units) were required to meet a NO_x emission limit of 30 ppm (at three percent O₂, dry) and a CO emission limit of 400 ppm. However, Rule 1146.2 was amended in January 2005 to address technical and cost issues associated with retrofitting existing units and to delay compliance dates for existing in-use equipment until an affected unit was 15 years old as of the equipment manufacture date. Rule 1146.2 was amended again in May 2006 to lower the NO_x emission limit for new units to 20 ppm and set a compliance date of January 1, 2012 for new Type 1 units and January 1, 2010 for new Type 2 units. For pool heaters rated at less than or equal to 400,000 Btu per hour, the existing NO_x emission limit of 55 ppm (or 40 ng per J heat output) remained unchanged.

In October 1993, the SCAQMD Governing Board adopted Regulation XX –RECLAIM to reduce NO_x and SO_x emissions from facilities. The RECLAIM program was designed to take a market-based approach to achieve emission reductions, as an aggregate. The RECLAIM program was created to be equivalent to achieving emissions reductions under a command-and-control approach, but by providing facilities with the flexibility to seek the most cost-effective solution to reduce their emissions. The market-based approach used in RECLAIM was based on using a supply-and-demand concept, where the cost to control emissions and reduce a facility's emissions would eventually become less than the diminishing supply of NO_x RTCs. However, analysis of the RECLAIM program over the long term has shown that the ability to achieve actual NO_x emission reductions has diminished.

In the 2016 AQMP, control measure CMB-05 - Further NO_x Reductions from RECLAIM Assessment, committed to achieving NO_x emission reductions of five tons per day by 2025, along with achieving BARCT level equivalency for all facilities through a command-and-control regulatory structure, while alleviating facilities from installing technology that would quickly become obsolete or serve as an intermediate technology. The process of transitioning NO_x RECLAIM facilities to a command-and-control regulatory structure will ensure that the affected equipment will meet BARCT level equivalency as soon as practicable. As a result of control measure CMB-05 from the 2016 AQMP and ABs 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NO_x RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. SCAQMD staff has begun this transition process by proposing amendments to Rules 1146, 1146.1, and 1146.2 (e.g., the PARs 1146 series) and this is one of the first sets of rules to be amended to initiate the transition of equipment from the NO_x RECLAIM program to a command-and-control regulatory structure, while achieving BARCT. PARs 1146 series will transition 27 facilities out of the RECLAIM program.

In addition, SCAQMD staff has developed PR 1100 to establish the compliance schedule for Rules 1146 and 1146.1 units~~the PARs 1146 series at RECLAIM facilities exiting the RECLAIM program.~~ It is important to note that the procedures for transitioning out of RECLAIM and addressing a facility's RTCs holdings are in Rule 2002 – Allocations for Oxides of Nitrogen (NO_x) and Oxides of Sulfur (SO_x).

As part of the rule development process, a BARCT assessment was conducted for Rules 1146 ~~and 1146.1, and 1146.2~~, which concluded that the current NO_x emissions limits in Rules 1146 and 1146.1 represent BARCT for only some categories of equipment. However, SCAQMD staff's analysis concluded that the NO_x emission limits for other equipment categories subject to either

Rules 1146 or 1146.1 would need to be lowered to meet BARCT level equivalency. In the 2006 amendments to Rule 1146.2, a technology assessment was conducted and SCAQMD staff determined that there is a potential that the NOx limits could be lowered pending further evaluation. In order to achieve NOx emission reductions at the earliest possible date, SCAQMD staff has focused their rule development efforts on the larger pieces of equipment which are subject to Rules 1146 and 1146.1. As such, PARs 1146 series and PR 1100 will require applicable equipment at RECLAIM facilities to meet proposed existing NOx emission limits. SCR technology/systems and ultra low-NOx burners are expected to be the main technologies employed to achieve the ~~current~~ NOx emission limits for equipment that will become subject to Rules 1146, 1146.1, and 1146.2. PR 1100 also includes a provision for allowing extra time (January 1, 2023) to comply with the existing NOx emission limits in Rules 1146 and 1146.1 for any operator that commits to fully replacing the affected equipment, in lieu of retrofitting existing equipment by installing ultra-low NOx burners or SCRs.

If RECLAIM facilities elect to install equipment or air pollution control equipment in order to meet the current Rule 1146.2 NOx emission limits prior to amending Rule 1146.2 to incorporate lower NOx emission limits, the units might not comply with the final NOx limit that is incorporated into the rule. As such, facilities electing to install these units would run the risk of installing equipment that would likely need to be further modified in order to comply with the anticipated future amendments to Rule 1146.2. In order to consider the viability of lowering the NOx emission limits in Rule 1146.2, SCAQMD staff will conduct additional BARCT research along with obtaining updated emission inventory data if that is available. If the research shows BARCT is more stringent so that significant additional emissions reductions can be obtained, then staff will initiate a subsequent rule development process. ~~PAR 1146.2 will require affected facilities to exit RECLAIM. To assist in future rulemaking efforts, PAR 1146.2 will require RECLAIM facilities with units subject to Rule 1146.2 to provide equipment data to the Executive Officer by September 1, 2018.~~

In addition, PARs 1146 series and PR 1100 will exempt any unit at a RECLAIM facility subject to a NOx emission limit in a different rule for an industry-specific category, since BARCT requirements would be established in the industry-specific landing rule. In addition, PARs 1146 series and PR 1100 are not expected to create additional monitoring, reporting, and recordkeeping requirements that differ from existing requirements at current RECLAIM facilities.

PROJECT OBJECTIVES

The main objectives of the PARs 1146 series are to transition various sizes of boilers, steam generators, process heaters, and large water heaters operating at RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure by requiring compliance with the applicable NOx emission limits in SCAQMD Rules 1146, 1146.1, 1146.2 to achieve BARCT NOx emissions equivalency for these units. Another objective of the proposed project is to implement control measure CMB-05 from the 2016 AQMP to achieve NOx emission reductions of five tons per day by 2025.

PROJECT DESCRIPTION

If adopted, PARs 1146 series would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit

application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on units with applicable air pollution control equipment and require annual ammonia source testing; and 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. Implementation of the proposed project is estimated to reduce NOx emissions by 0.27 ton per day by January 1, 2023. ~~–1) expand the applicability to include units that were not previously required to comply with Rules 1146 and 1146.1 because they were in the NOx RECLAIM program; 2) require RECLAIM facilities to submit a permit application within 12 months of the date of rule adoption for each unit that does not currently meet the NOx concentration limits in Rules 1146 and/or 1146.1; 3) require the affected equipment to meet the applicable NOx concentration limit for all Rule 1146 and Rule 1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146 or Rule 1146.1 units to notify the Executive Officer which unit(s) will be replaced; and 5) require RECLAIM facilities with Rule 1146.2 units to meet NOx emission limits by December 31, 2023 if a more stringent BARCT limit is not applicable. PR 1100 is an administrative rule which establishes the compliance schedule for facilities exiting the RECLAIM program and allows facilities with Rule 1146/1146.1 units until January 1, 2022 to retrofit all existing units and until January 1, 2023 to replace any existing units, upon notification to the Executive Officer. Implementation of the proposed project is estimated to reduce NOx emissions by 0.23 ton per day by January 1, 2023.~~

The following is a detailed summary of key elements contained in PARs 1146 series and PR 1100. A copy of PARs 1146, 1146.1, and 1146.2, and PR 1100 can be found in Appendix A.

PAR 1146

Applicability - Subdivision (a)

The exemptions contained in subdivision (a) are proposed to be moved to new subdivision (f) – Exemptions. Upon the date of adoption, PAR 1146 will clarify that the exemption of RECLAIM (NOx emissions only) facilities applies only to any RECLAIM or former RECLAIM facility that is in an industry-specific category specified in Rule 1100 – Implementation Schedule for NOx Facilities.

Definitions - Subdivision (b)

New~~The~~ definitions of Fire-tube Boiler; Former RECLAIM Facility; Modification; Non-RECLAIM Facility; and RECLAIM Facility are proposed be added. The following definitions are proposed to be revised including: Annual Heat Input; Group I Unit; Group III Unit; Heat Input; NOx Emissions; Rated Heat Input Capacity; and Thermal Fluid Heater.

Requirements - Subdivision (c)

Subdivision (c) proposes to require the owner or operator of any unit(s) subject to Rule 1146 to meet applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), and (c)(4); notwithstanding the exemptions contained in Table 1 – Existing Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions, of subdivision (j) of Rule 2001. A change to paragraph (c)(1) proposes to require the owner or operator of a RECLAIM or

former RECLAIM facility to comply with the applicable NO_x emission limits specified in Table 1146-1 in accordance with the schedule specified in Rule 1100.

Table 1146-1 – Standard Compliance Limits is proposed to be modified to include new NO_x emission limits and compliance schedules for certain Group II or Group III units and thermal fluid heaters. As such, the following subparagraphs have been changed as follows:

~~(c)(1)(K), as shown below is proposed to be added to Table 1146-1 – Standard Compliance Limits and Schedule.~~

Rule Reference	Category	Limit
~~(c)(1)(K)~~	~~RECLAIM Units~~	~~As specified in this Table~~

<u>Rule Reference</u>	<u>Category</u>	<u>Limit</u> ¹	<u>Compliance Schedule² for NON-RECLAIM Facilities</u>	<u>Compliance Schedule for RECLAIM and FORMER RECLAIM Facilities</u>
<u>(c)(1)(G)</u>	<u>Group II Units (with an existing NOx limit ≥12 ppm)</u>	<u>5 ppm or 0.0062 lb/10⁶ Btu</u>	<u>January 1, 2016</u>	<u>See PR 1100 – Implementation Schedule for NOx Facilities</u>
<u>(c)(1)(H)</u>	<u>Group II Units (with an existing NOx limit < 12 ppm)</u>	<u>7 ppm or 0.0085 lb/10⁶ Btu for fire-tube boilers only;</u> <u>9 ppm or 0.011 lb/10⁶ Btu for all others</u>	<u>See subparagraph (c)(7)(A)</u>	
<u>(c)(1)(I)</u>	<u>Group III Units (Fire-tube Boilers Only)</u>	<u>7 ppm or 0.0085 lb/10⁶ Btu</u>	<u>See subparagraph (c)(7)(B)</u>	
<u>(c)(1)(J)</u>	<u>Group III Units (Excluding Fire-tube Boilers)</u>	<u>9 ppm or 0.001 lb/10⁶ Btu</u>		
<u>(c)(1)(K)</u>	<u>Thermal Fluid Heaters</u>	<u>12 ppm or 0.015 lbs/10⁶ Btu</u>	<u>See subparagraph (c)(7)(C) for units with an existing NOx limit ≤ 20 ppm</u> <u>See paragraph (e)(2) for units with an existing NOx limit ≥ 20 ppm</u>	

¹ All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Paragraph (c)(2) is proposed to be removed and replaced with requirements for units with air pollution control equipment resulting in ammonia emissions in the exhaust. The ammonia emissions would be limited to less than five ppm (referenced at three percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes).proposes to exempt a RECLAIM or former RECLAIM facility subject to Rule 1100, from the requirements in Table 1146.2. Requirements in Table 1146.2, which specify an enhanced compliance schedule would not apply for a RECLAIM facility subject to Rule 1100.

Paragraph (c)(4) clarifies that the carbon monoxide (CO) emission limit of 400 ppm is referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Paragraph (c)(5) proposes to allow a provision for low fuel usage units (annual heat input less than or equal to 90,000 therms per year) that have been in operation prior to September 5, 2008 for non-RECLAIM facilities or in operation prior to 12 months from the date of rule adoption at a RECLAIM or former RECLAIM facility subject to Rule 1100, in lieu of complying with the applicable NOx emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), and (c)(4), (e)(1), and (e)(2).

Subparagraph (c)(5)(B) proposes to require the owner of any unit(s) selecting the tune-up option, to maintain records for a rolling 24-month period in order to verify that the required tune-ups have been performed.

Paragraph (c)(7) proposes to allow a RECLAIM or former RECLAIM facility that installs or modifies a Group III natural gas fired unit prior to the date of rule adoption and complying with the applicable BACT emission limit of 12 ppm or less of NOx to defer compliance with the compliance dates specified in Rule 1100 until the unit's burner(s) replacement.

Paragraph (c)(6) proposes notwithstanding the exemptions contained in Table 1- Existing Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions, of subdivision (j) of Rule 2001, any unit with a rated heat input capacity greater than or equal to 40 million Btu per hour and with an annual heat input greater than 200×10^9 Btu per year to have a continuous in-stack nitrogen oxides monitor or equivalent verification system in compliance with to Rules 218 and 218.1, and 40 CFR Part 60 Appendix B Specification 2. Maintenance and emission records will be required to be maintained and made accessible for two years.

Paragraph (c)(7) proposes to allow an owner or operator of a non-RECLAIM facility that has installed or modified certain units prior to the date of rule adoption to defer compliance with the specified NOx emission limit until the replacement of at least 50 percent of the unit's burners or 15 years from the date of rule adoption, whichever is earlier. The units allowed to defer compliance include the following: Group II units subject to subparagraph (c)(2)(H) complying with a NOx emission limit of nine ppm or less as specified in a SCAQMD Permit to Operate; or Group III units subject to either subparagraph (c)(1)(I) or (c)(1)(J) complying with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or thermal fluid heaters subject to subparagraph (c)(1)(K) complying with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate.

Paragraph (c)(8) proposes to allow an owner or operator of a non-RECLAIM facility that has installed or modified prior to the date of rule adoption any unit(s) operating with an air pollution control equipment that results in ammonia emissions in the exhaust complying, as specified in a

SCAQMD Permit to Operate and with an emission limit greater than five ppm, to defer compliance with the ammonia emission limit (as specified in paragraph (c)(2)) until the air pollution control equipment is replaced or modified.

Paragraph (c)(9) proposes to remove the reference to paragraph (c)(2), since it is no longer applicable.

Paragraph (c)(10) proposes to require units using landfill or digester gas (biogas) co-fired with natural gas at a RECLAIM or former RECLAIM facility to comply with emission limits in subparagraphs (c)(1)(C) or (c)(1)(D) Table 1146-1, provided that the facility monthly average biogas usage by the biogas units is 90 percent or more, based on the higher heating value of the fuels used, by the applicable compliance date specified in Rule 1100.

Compliance Determination - Subdivision (d)

Paragraphs (d)(1), (d)(4), and (d)(5) and subparagraph (d)(8)(A) propose to remove references to previous paragraph (c)(2), since it is no longer applicable.

Paragraph (d)(2) proposes to limit the time needed for start-ups or shut downs, to not last longer than necessary to reach stable conditions.

Paragraph (d)(3) proposes to require the owner or operator of the air pollution control equipment subject to the ammonia emission limit to demonstrate compliance within 12 months of unit operation after the date of rule adoption and annually within 12 months thereafter, according to the procedures in District Source Test Method 207.1 for Determination of Ammonia Emissions from Stationary Sources.

Paragraph (d)(5) proposes to allow the owner of a unit, to select the lb/MMBtu heat input compliance option, in order to calculate the NOx and CO emissions according to the specified procedure and protocol.

Paragraph (d)(8) proposes to include and clarify that exception for units subject to paragraph (c)(6) from conducting periodic monitoring for NOx emissions. , any owner or operator subject to this rule is required to perform diagnostic emission checks of NOx emissions with a portable NOx, CO, and oxygen analyzer according to the Protocol for the Periodic Monitoring of NOx, CO, and Oxygen from Units Subject to SCAQMD Rules 1146 and 1146.1 by the applicable schedule specified in subparagraphs (d)(8)(A) to (d)(8)(D). Subparagraph (d)(8)(A) proposes new requirements for owners and operations checking NOx emissions of units subject to paragraphs (c)(1), (c)(3), or (c)(4). Subparagraph (d)(8)(B) proposes on or after 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier, to require owner or operators complying with the requirements in paragraph (c)(5) to verify NOx emissions according to the tune-up schedule specified in subparagraph (c)(5)(B).

Subparagraph (d)(8)(A) proposes to allow six months after the applicable compliance date specified in Rule 1100 for a RECLAIM or former RECLAIM facility to conduct periodic monitoring for NOx emissions.

Paragraph (d)(9) proposes to use the phrase "million Btu per hour" instead of "mmbtu/hr" to describe the units to provide consistency within the rule.

~~Subparagraph (d)(8)(B) proposes to allow a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 or during a burner replacement, whichever occurs later, to conduct NOx emission checks for low fuel usage units according to the existing tune-up schedule contained in subparagraph (c)(5)(B).~~

Compliance Schedule - Subdivision (e)

~~Subparagraph (e)(1) proposes to require the owner or operator of exempt any unit(s) subject to paragraph (c)(1) at a RECLAIM or former RECLAIM facility to meet the applicable NOx emission limit in Table 1146-1 according to the subject to Rule 1100 from the compliance schedule specified in PR 1100 Table 1146-1.~~

~~Subparagraph (e)(2) proposes to require owners or operators of any thermal fluid heater at a non-RECLAIM facility with a NOx emission limit greater than 20 ppm to submit a complete SCAQMD permit application for each unit within 12 months from the date of rule adoption and by January 1, 2022 to meet the applicable NOx emission limit in Table 1146-1.~~

~~exempt units at a RECLAIM or former RECLAIM facility subject to Rule 1100 from the compliance schedule specified in Table 1146-2.~~

~~Subparagraph (e)(3) proposes to prohibit units complying with paragraph (c)(5) to discharge greater than 12 ppm in NOx emissions on or after 15 years after the date of rule adoption or when 50 percent of more of the unit's burners are replaced, whichever is earlier. proposes to allow low fuel usage unit(s) at a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 or during burner replacement, whichever occurs later, to install a burner meeting the NOx emission limit of 30 ppm as specified in Table 1146-1 or subparagraph (c)(1)(A).~~

Exemptions - Subdivision (f)

New subdivision (f) is proposing to exempt the following units: boilers used by electric utilities to generate electricity; boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; sulfur plant reaction boilers; and any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in PR 1100.

PAR 1146.1

Applicability - Subdivision (a)

The exemptions contained in subdivision (a) are proposed to be moved to new subdivision (f) – Exemptions.

Effective upon the date of adoption, PAR 1146.1 will clarify that the exemption of RECLAIM (NOx emissions only) facilities applies only to any RECLAIM facility or former RECLAIM facility that is in an industry-specific category specified in Rule 1100 – Implementation Schedule for NOx Facilities.

Definitions - Subdivision (b)

New~~The~~ definitions of Fire-Tube Boiler; Former RECLAIM Facility; Modification; Non-RECLAIM Facility; and RECLAIM Facility are proposed be added.

The following definitions are proposed to be modified: Annual Heat Input; NOx Emissions; Rated Heat Input Capacity; and Thermal Fluid Heater.

Because of the addition of new definitions, the definitions in subdivision (b) have been renumbered; thus, a reference to a paragraph in the one of the definitions has been modified.

Requirements - Subdivision (c)

Subdivision (c) requires units to meet emission limits specified in paragraphs (c)(1) through (c)(3), notwithstanding the exemptions contained in subdivision (j) of Rule 2001.

Paragraph (c)(1) proposes to exempt units at a RECLAIM or former RECLAIM facility subject to Rule 1100 from the NO_x emission limit of 30 ppm. However, Paragraph (c)(12) is proposed to be removed and subsumed into Table 1146.1-1. Table 1146.1-1 is proposed to be changed as follows: proposes to require the owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1100 to meet the applicable NO_x emission limits specified in Table 1146.1-1 in accordance with the schedule specified in Rule 1100. As such the following is proposed to be added to Table 1146.1-1:-

<u>Rule Reference</u>	<u>Category</u>	<u>Limit¹</u>	<u>Compliance Schedule for NON-RECLAIM Facilities</u>	<u>Compliance Schedule for RECLAIM and former RECLAIM Facilities</u>
<u>(c)(1)(A)</u>	<u>All Other Units</u>	<u>30 ppm or for natural gas fired units 0.036 lb/10⁶ Btu</u>	<u>September 5, 2008</u>	<u>See PR Rule 1100 – Implementation Schedule for NOx Facilities</u>
<u>(c)(1)(B)</u>	<u>Any Units Fired on Landfill Gas</u>	<u>25 ppm</u>	<u>January 1, 2015</u>	
<u>(c)(1)(C)</u>	<u>Any Units Fired on Digester Gas</u>	<u>15 ppm</u>	<u>January 1, 2015</u>	
<u>(c)(1)(D)</u>	<u>Atmospheric Units</u>	<u>12 ppm or 0.015 lb/10⁶ Btu</u>	<u>January 1, 2014</u>	
<u>(c)(1)(C)</u>	<u>Any Units Fired on Natural Gas, Excluding Fire-tube Boilers, Atmospheric Units, and Thermal Fluid Heaters</u>	<u>9 ppm or 0.011 lb/10⁶ Btu</u>	<u>See subparagraph (c)(5)(A)</u>	
<u>(c)(2)(F)</u>	<u>Any Fire-tube Boilers Fired on Natural Gas</u>	<u>7 ppm or 0.0085 lb/10⁶ Btu</u>		
<u>(c)(2)(G)</u>	<u>Thermal Fluid Heaters</u>	<u>12 ppm or 0.015 lb/10⁶ Btu</u>	<u>See subparagraph (c)(5)(B) for units with an existing NOx limit ≤ 20 ppm</u> <u>See paragraph (e)(2) for units with an existing NOx limit ≥ 20 ppm</u>	

¹All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

RECLAIM Units	As specified in this Table		

Paragraph (c)(3) proposes to specify that CO emissions will need to be referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Paragraph (c)(45) proposes to ~~relieve~~allow a provision for low fuel usage unit(s) with an (annual heat input of less than or equal to 18,000 therms per calendar year ~~that have been~~) in operation prior to September 5, 2008 for non-RECLAIM facilities ~~or at a RECLAIM or former RECLAIM facility that has been~~ in operation 12 months prior to the date of rule adoption for RECLAIM or former RECLAIM facilities, ~~from having to otherwise~~in lieu of ~~complying~~ comply with the applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), ~~(e)(1), and (e)(24).~~

Paragraph (c)(56) proposes to allow an owner or operator of a non-RECLAIM facility that has installed or modified, prior to the date of rule adoption, a natural gas-fired unit subject to subparagraph (c)(1)(E) or (c)(1)(F) with a NOx emission limit of 12 ppm or less, or a thermal fluid heater subject to subparagraph (c)(1)(G) with a NOx emission limit of 20 ppm or less to defer compliance with the applicable NOx emission limits until replacement of at least 50 percent of the unit's burners or 15 years from the date of rule adoption, whichever is earlier occurs, ~~or former RECLAIM facility that installs or modifies a natural gas fired unit prior to the date of rule adoption and complying with the BACT emission limit of 12 ppm or less of NOx to defer compliance with paragraph (c)(2) or the compliance dates in Rule 1100 until the unit's burner(s) replacement.~~

Paragraph (c)(78) proposes to remove the reference to the compliance date January 1, 2015 since the date has already passed. ~~proposes to require units using landfill or digester gas (biogas) co-fired with natural gas at a RECLAIM or former RECLAIM facility to comply with the emission limits in Table 1146.1-1, provided that the facility monthly average biogas usage by the biogas units is 90 percent or more, based on the higher heating value of the fuels used, by the applicable compliance date specified in Rule 1100.~~

Compliance Determination - Subdivision (d)

Paragraph (d)(3) is proposed to be removed since Table 1146.1-1 is proposed to incorporate the requirement that the emission limits as ppm will be referenced at three percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Subparagraph (d)(6)(A) proposes to remove the compliance date that has passed and add paragraph (c)(2) for determining weighted average.

Subparagraph (d)(6)(B) proposes to require low fuel usage unit(s) complying with paragraph (c)(4) on or after 15 years from the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier, to verify NOx emissions according to the tune-up schedule in subparagraph (c)(4)(B).

Subparagraph (d)(7)(A) proposes to remove the reference to the compliance date July 1, 2009 since the date has already passed. ~~proposes to allow six months after the compliance date specified in Rule 1100 for a RECLAIM or former RECLAIM facility to conduct periodic monitoring for NOx emissions.~~

Subparagraph (d)(7)(B) ~~proposes to allow a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 or during a burner replacement, whichever~~

~~occurs later, to conduct NOx emission checks for low fuel usage units according to the existing tune-up schedule contained in subparagraph (c)(5)(B).~~

Compliance Schedule – Subdivision (e)

Paragraph(e)(1) proposes to require a unit at a RECLAIM facility or former RECLAIM facility with any unit subject to paragraph (c)(1) to meet the applicable NOx emission limit in Table 1146.1-1 in accordance with the schedule specified with PR 1100.

~~Paragraph (e)(2) proposes to requireallow any thermal fluid heaters at a non-RECLAIM facility with an emission limit greater than 20 ppm to submit a complete permit application on or before 12 months from the date of rule adoption and to meet the NOx emission limit in Table 1146.1-1 as specified in subparagraph (c)(1)(G). low fuel usage unit at a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 during burner replacement, whichever occurs later, to install a burner meeting the NOx emission level of 30 ppm, as specified in paragraph (c)(1).~~

Paragraph (e)(3) proposes to prohibit NOx emissions in excess of 12 ppm, on or after 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier.

Exemptions - Subdivision (f)

New subdivision (f) is proposed to include an exemption of any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category as defined in PR 1100.

PAR 1146.2

Definitions - Subdivision (b)

The definitions of Best Available Retrofit Control Technology (BARCT); Former RECLAIM Facility and RECLAIM Facility are proposed be added.

Requirements - Subdivision (c)

Paragraph (c)(3) proposes to exempt units at a RECLAIM or former RECLAIM facility rated at a heat input capacity of greater than one MMBtu per hour but less than or equal to two MMBtu per hour that do not meet the NOx emission limit of 30 ppm (0.036 pound NOx per MMBtu) and 400 ppm of CO (at three percent oxygen (O₂), dry) as specified in paragraph (c)(1).

Paragraph (c)(4) proposes to exempt units at a RECLAIM or former RECLAIM facility greater than 15 years old, based on the original date of manufacture, and with a rated heat input capacity of greater than one MMBtu per hour but less than or equal to two MMBtu per hour that do not meet the NOx emission limit of 30 ppm (0.036 pound NOx per MMBtu) and 400 ppm of CO (at three percent oxygen (O₂), dry) as specified in paragraph (c)(1).

Paragraph (c)(5) proposes to exempt units at a RECLAIM or former RECLAIM facility greater than 15 years old, based on the original date of manufacture, and with a rated heat input capacity greater than 400,000 Btu per hour but less than or equal to one MMBtu per hour that do not meet the NOx emission limit of 30 ppm (0.036 pound NOx per MMBtu) and 400 ppm of CO (at three percent oxygen (O₂), dry) as specified in paragraph (c)(1).

Paragraphs (c)(9) and (c)(10) propose to incorporate the exemptions currently contained in Rule 2001 subdivision (j) and its accompanying Table 1 which contains maintenance requirements for Type 2 units and a copy of all documents identifying the unit's rated heat input capacity, respectively.

Paragraph (c)(13) proposes to require a technology assessment to be conducted by January 1, 2022 to determine if the NOx emission limits in subdivision (c) represent BARCT. If the NOx emission limits are confirmed or verified that they represent BARCT, notwithstanding the exemptions contained in Rule 2001 subdivision (j) and its accompanying Table 1, units at RECLAIM or former RECLAIM facilities with any Type 2 units will be required to meet the NOx emission limits by December 21, 2023. However, if it is determined a more stringent BARCT requirement is needed, SCAQMD will be required to initiate rule development within six months of the completion of the technology assessment.

Exemptions - Subdivision (h)

Paragraph (h)(3) is proposed to exempt any RECLAIM facility or former RECLAIM facility, that is subject to a NOx emission limit in a different rule for in an industry-specific category specified in PR Rule 1100 from the requirement to comply with NOx emissions limits contained in of paragraphs (c)(1) to (c)(5).

PR 1100

Purpose – Subdivision (a)

Subdivision (a) defines the purpose of Rule 1100 is to establish the implementation schedule for when Regulation XX NOx RECLAIM facilities transition to a command-and-control regulatory structure.

Applicability – Subdivision (b)

Subdivision (b) establishes the applicability to include RECLAIM or former RECLAIM facilities that own or operate equipment that meets the applicability provisions specified in Rules 1146 and, 1146.1, and 1146.2.

Definitions - Subdivision (c)

The following new definitions are proposed: Btu; Heat Input; Former RECLAIM Facility; Heat Input; Industry-Specific Category; NOx Emissions, Rated Heat Input Capacity; RECLAIM Facility; Rule 1146 Unit; Rule 1146.1 Unit; and Title V Facility; and Rule 1146.2 Unit.

Rule 1146 and Rule 1146.1 Implementation Schedule - Subdivision (d)

Paragraph (d)(1) is proposed to establish the timing when an owner or operator of a RECLAIM facility with any Rule 1146 or any Rule 1146.1 units will need to comply with the following requirements:

- On or before 12 months after ~~from~~ the date of rule adoption, submit complete permit applications for Rule 1146 and Rule 1146.1 units that do not currently meet the NOx concentration limits established in Rules 1146 and 1146.1 at the facility;
- On or before January 1, 2021, meet the applicable NOx concentration limit for a minimum of 75 percent of the cumulative total heat input ~~for~~ capacity for ~~of~~ all Rule 1146 and Rule 1146.1 units; and

- On or before January 1, 2022, meet the applicable NOx concentration limit of 100 percent of Rule 1146 and Rule 1146.1 units (by heat input) at the facility.

Paragraph (d)(2) proposes to allow units that are not retrofitted and will undergo complete replacement to~~can~~ defer compliance until January 1, 2023, provided the facility submits a complete permit application on or before 12 months after the date of rule adoption for any new Rule 1146 and/or Rule 1146.1 unit, as well as accepts a permit condition that identifies which unit(s) will be replaced and no longer operated when the new units are installed or after January 1, 2023, whichever is earlier; and replaces the existing unit on or before January 1, 2023. ~~notifies the Executive Officer (including Facility Name, Facility Identification Number, Permit Number for the unit(s) being replaced; size of the existing and new units (MMBtu/hr), and fuel type) within 12 months after the date of rule adoption; on or before 12 months of the date of rule adoption submits a complete permit application for the new Rule 1146 and Rule 1146.1 unit(s); and demonstrates that the heat input capacity of the new unit does not exceed the total heat input capacity of existing units being replaced.~~

~~Subp~~Paragraph (d)(3)(E) is proposed to establish the applicable NOx concentration limits for units meeting the minimum compliance deadline of 75 percent of the cumulative total heat input for all Rule 1146 and Rule 1146.1 units by January 1, 2021 and 100 percent by January 1, 2022. Rules 1146 and 1146.1 units would be required to meet the NOx concentration limit in Rule 1146, Table 1146-1 and Rule 1146.1, Table 1146.1-1, respectively. Rule 1146 units that meet the applicability provisions specified in Rule 1146 paragraph (c)(2) will also be required to meet the ammonia emission limit specified in Rule 1146 paragraph (c)(2). In addition Rule 1146.1 units meeting the applicability provisions in Rule 1146.1 paragraph (c)(~~7~~8) will be required to meet the NOx concentration limit specified in Rule 1146.1 paragraph(c)(~~7~~8).

Paragraph (d)(~~4~~2) is proposed to require an owner or operator of a RECLAIM or former RECLAIM facility with any Rule 1146 or Rule 1146.1 unit that has been installed or modified prior to the date of rule adoption to meet the specified NOx emission limit within 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier. The following are Rule 1146 units:

- Units subject to subparagraph (c)(1)(F) with a NOx emission limit of seven ppm or less as specified in a SCAQMD Permit to Operate; or
- Units subject subparagraph (c)(1)(H) or (c)(1)(I) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate and
- Thermal fluid heaters, as defined in Rule 1146 paragraph (b)(27), subject to Rule 1146 subject to Rule 1146 subparagraph (c)(1)(K) with a NOx emission limit of 20 ppl or less as specified in SCAQMD Permit to Operate.

The following are Rule 1146.1 units:

- Units subject to Rule 1146.1 subparagraph (c)(1)(E) or (c)(1)(F) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or
- Thermal fluid heaters, as defined in Rule 1146.1 subparagraph (c)(1)(G) with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate. ~~Rule 1146.2 Type 2 units to meet the NOx concentration limit specified in Rule 1146.2,~~

~~paragraph (c)(1) unless a more stringent limit is applicable by December 31, 2023. A unit may be modified or demonstrated to meet the NO_x emission limits pursuant to the provisions of Rule 1146.2, subdivision (e).~~

Paragraph (d)(53) proposes to exempt any unit at a RECLAIM or former RECLAIM facility that is subject to a NO_x emission limit in a different rule ~~identified in an industry-specific category identified.~~

Monitoring, Reporting, and Recordkeeping Requirements - Subdivision (e)

Paragraph ~~(e)(1)(d)(4)~~ is proposed to require Title V facilities to comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012.

Paragraph ~~(e)(2)(d)(5)~~ is proposed ~~to require~~ for a non-Title V RECLAIM facilities ~~that becomes a former RECLAIM facilities~~ to comply with the monitoring, reporting, and recordkeeping requirements in the applicable rule(s) as specified in subdivision (b), upon the date the RECLAIM facility becomes a former RECLAIM facility.

SUMMARY OF AFFECTED EQUIPMENT

Among the 266 facilities currently in the NO_x RECLAIM program, approximately 103444 RECLAIM facilities will be affected by PARs 1146 series and PR 1100. Of the 103444 RECLAIM facilities, overall 291323 permitted units will be affected by PARs 1146 series and PR 1100. Of the 291 permitted units, 148 units are projected to be retrofitted in order to meet the NO_x emission limits. It is estimated PARs 1146 series and PR 1100 will reduce NO_x by 0.23-0.27 ton per day by January 1, 2023. It is noteworthy that there are units at non-RECLAIM facilities that are expected to be affected by PARs 1146 series and these units are projected to either be retrofitted or replaced. Certain units would need to meet the NO_x emission limits either during burner replacement or 15 years after the date of rule adoption. Thermal fluid heaters currently permitted at greater than 20 ppm must submit a permit application within 12 months of rule adoption and must meet the NO_x emission limit of 12 ppm by January 1, 2022. However, because the replacement of a burner or retrofitting a boiler would be dependent on facility-specific variables (e.g., age of burner, ability to retrofit, cost, etc.), it is difficult to quantify the number of units at non-RECLAIM facilities that would be affected by PARs 1146 series and determine when any burner replacements or boiler retrofits would occur

predict and speculative when and the number of units at non-RECLAIM facilities that would be affected by PARs 1146 series. Table 2-1 identifies the industry sectors, as classified by the North American Industry Classification System (NAICS) code, and the number of respective units at RECLAIM facilities subject to PARs 1146 series and PR 1100.

Table 2-1
Affected Industry Subject to PARs 1146 series and PR 1100

NAICS Code	Description of Industry	Number of Units
211111	Oil and Gas Extraction	<u>78</u>
211120	Crude Petroleum Extraction	<u>78</u>
221112	Fossil Fuel Electric Power Generation	<u>54</u>
221210	Natural Gas Distribution	3
221330	Steam and Air-Conditioning Supply	<u>69</u>
311111	Dog and Cat Food Manufacturing	1
311511	Fluid Milk Manufacturing	2
311611	Animal (except Poultry) Slaughtering	3
311613	Rendering and Meat Byproduct Processing	<u>38</u>
311812	Commercial Bakeries	3
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour	5
311930	Flavoring Syrup and Concentrate Manufacturing	1
312120	Breweries	<u>67</u>
313210	Broadwoven Fabric Mills	<u>65</u>
313310	Textile and Fabric Finishing Mills	12
314110	Carpet and Rug Mills	12
322110	Pulp Mills	1
322121	Paper (except Newsprint) Mills	4
322130	Paperboard Mills	<u>67</u>
322211	Corrugated and Solid Fiber Box Manufacturing	5
~~324110~~	~~Petroleum Refineries~~	4
324121	Asphalt Paving Mixture and Block Manufacturing	<u>612</u>
324122	Asphalt Shingle and Coating Materials Manufacturing	<u>712</u>
324191	Petroleum Lubricating Oil and Grease Manufacturing	4
<u>325120</u>	<u>Chemical Manufacturing</u>	<u>6</u>
325180	Other Basic Inorganic Chemical Manufacturing	3
325211	Plastics Material and Resin Manufacturing	2
325411	Medicinal and Botanical Manufacturing	1
325412	Pharmaceutical Preparation Manufacturing	<u>12</u>
325414	Biological Product (except Diagnostic) Manufacturing	2
326140	Polystyrene Foam Product Manufacturing	6
327120	Clay Building Material and Refractories Manufacturing	1
331222	Steel Wire Drawing	2
331315	Aluminum Sheet, Plate, and Foil Manufacturing	2
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	2
331529	Other Nonferrous Metal Foundries (except Die-Casting)	1
332111	Iron and Steel Forging	3

Table 2-1
Affected Industry Subject to PARs 1146 series and PR 1100 (Concluded)

NAICS Code	Description of Industry	Number of Units
332431	Metal Can Manufacturing	3
~~332811~~	~~Metal Heat Treating~~	~~1~~
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	2
332996	Fabricated Pipe and Pipe Fitting Manufacturing	5
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	25
334412	Bare Printed Circuit Board Manufacturing	2
334413	Semiconductor and Related Device Manufacturing	7
336411	Aircraft Manufacturing	~~3237~~
336412	Aircraft Engine and Engine Parts Manufacturing	2
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	3
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	2
339991	Gasket, Packing, and Sealing Device Manufacturing	2
445110	Supermarkets and Other Grocery (except Convenience) Stores	4
486110	Pipeline Transportation of Crude Oil	~~78~~
486210	Pipeline Transportation of Natural Gas	9
486910	Pipeline Transportation of Refined Petroleum Products	3
488111	Air Traffic Control	2
522120	Savings Institutions	1
531210	Offices of Real Estate Agents and Brokers	2
541511	Custom Computer Programming Services	2
~~541990~~	~~All Other Professional, Scientific, and Technical Services~~	~~1~~
561110	Office Administrative Services	3
713110	Amusement and Theme Parks	19
721110	Hotels (except Casino Hotels) and Motels	~~24~~
812331	Linen Supply	~~35~~
812332	Industrial Launderers	2
Total		~~291323~~

CHAPTER 3

EXISTING SETTING

Introduction

Existing Setting

Air Quality

Hazards and Hazardous Materials

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 environmental analysis is commenced. The CEQA Guidelines define “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.” (CEQA Guidelines Section 15360; *see also* Public Resources Code Section 21060.5.) Furthermore, a CEQA document must include a description of the physical environment in the vicinity of the project, as it exists at the time the environmental analysis is commenced, from both a local and regional perspective. (CEQA Guidelines Section 15125.) Therefore, the “environment” or “existing setting” against which a project's impacts are compared consists of the immediate, contemporaneous physical conditions at and around the project site. (Remy, et al; 1996.)

The following sections summarize the existing setting for control measure CMB-05 and the existing rules that will be affected by the proposed project (e.g., PARs 1146 series) as well as the regional existing setting for air quality and hazards and hazardous materials which were the only environmental topics identified that may be adversely affected by the proposed project.

The March 2017 Final Program EIR for the 2016 AQMP also contains comprehensive information on existing and projected regional environmental settings for the topic of air quality and hazards and hazardous materials. The March 2017 Final Program EIR for the 2016 AQMP can be obtained by visiting the following website at: <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2016/2016aqmpfProgram EIR.pdf>.

Hard copies of the above referenced document as well as the other documents referenced in the following sections are also available by visiting the SCAQMD's Public Information Center at SCAQMD Headquarters located at 21865 Copley Drive, Diamond Bar, CA 91765; by contacting Fabian Wesson, Public Advisor by calling (909) 396-2039 or by emailing at PICrequests@aqmd.gov.

EXISTING SETTING

In general, Rules 1146, 1146.1, and 1146.2 were developed to reduce NO_x emissions from boilers, steam generators, process heaters, and natural gas-fired water heaters. Control measure CMB-05 in the 2016 AQMP was also developed to identify a series of approaches that can be explored to ensure equivalency with equipment-based command-and-control regulations implementing BARCT, and to generate further NO_x emission reductions at RECLAIM facilities. The following summarizes the existing setting for control measure CMB-05 as well as the current version of Rules 1146, 1146.1, and 1146.2.

CMB-05

The 2016 AQMP identifies control measures and strategies to bring the region into attainment with the revoked 1997 8-hour NAAQS (standard) (80 parts per billion (ppb)) for ozone by 2024; the 2008 8-hour ozone standard (75 ppb) by 2032; the 2012 annual PM_{2.5} standard (12 microgram per cubic meter (ug/m³) by 2025; the 2006 24-hour PM_{2.5} standard (35 ug/m³) by 2019; and the revoked 1979 1-hour ozone standard (120 ppb) by 2023. The 2016 AQMP consists of three

components: 1) the SCAQMD's Stationary, Area, and Mobile Source Control Measures; 2) State and Federal Control Measures provided by the CARB; and 3) Regional Transportation Strategy and Control Measures provided by the Southern California Association of Governments. The 2016 AQMP includes emission inventories and control measures for stationary, area and mobile sources, the most current air quality setting, updated growth projections, new modeling techniques, demonstrations of compliance with state and federal Clean Air Act requirements, and an implementation schedule for adoption of the proposed control strategy. Control measure CMB-05, one of several components in the 2016 AQMP, was developed to identify a series of approaches that can be explored to ensure equivalency with command-and-control regulations implementing BARCT, and to generate five tons per day of further NO_x emission reductions at RECLAIM facilities as soon as feasible, and no later than 2025, and to transition to a command-and-control regulatory structure requiring BARCT level controls as soon as practicable. Because many of the RECLAIM program's original advantages appeared to be diminishing, CMB-05 prescribed an orderly sunset of the RECLAIM program to create more regulatory certainty and reduce compliance burdens for RECLAIM facilities, while also achieving more actual and SIP creditable emissions reductions. A NO_x RECLAIM re-assessment working group was convened to examine the functionality, benefits, and challenges of the RECLAIM program and options for an orderly transition to a command-and-control structure. The conclusion from these working groups indicated a necessity to first amend Rules 1146, 1146.1 and 1146.2 as the first step in achieving the goals of CMB-05.

The analysis in the March 2017 Final Program EIR for the 2016 AQMP identified potential adverse impacts that may result from implementing the various components in the plan for the following environmental topic areas: 1) aesthetics; 2) air quality and GHGs; 3) energy; 4) hazards and hazardous materials; 5) hydrology and water quality; 6) noise; 7) solid and hazardous waste; and 8) transportation and traffic. The analysis concluded that significant and unavoidable adverse environmental impacts were expected to occur after implementing mitigation measures for the following topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: a) increased flammability of solvents; b) storage, accidental release and transportation of ammonia (which is specific to CMB-05); c) storage and transportation of liquefied natural gas (LNG); d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Mitigation measures for the potentially significant impacts were required and were made a condition of the approval. Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were adopted.

Rule 1146

Specifically, Rule 1146 applies to boilers, steam generators, and process heaters used at industrial, institutional, and commercial operations with a rated heat input capacity greater than or equal to five MMBtu per hour. Rule 1146 does not regulate NO_x emissions from boilers used by electric utilities to generate electricity, boilers and process heaters with a rated heat input capacity greater than 40 MMBtu per hour, and sulfur plant reactor boilers. Rule 1146 establishes three groups (Group I, Group II, and Group III) for units burning natural gas or gaseous fuels. Group I unit includes any unit burning natural gas with a rated heat input greater than or equal to 75 MMBtu per hour, excluding thermal fluid heaters, and is required to meet a NO_x emission limit of five

ppm or 0.0062 pound per MMBtu. Group II unit includes any unit burning gaseous fuels, excluding digester and landfill gases, with a rated heat input less than 75 MMBtu per hour and greater than or equal 20 MMBtu per hour, excluding thermal heaters. Group III units include any unit burning gaseous fuels, excluding digester and landfill gases, ~~and thermal fluid heaters~~ with a rated heat input less than 20 MMBtu per hour and greater than or equal to five MMBtu per hour, and all units operated at schools and universities greater than or equal to five MMBtu per hour, excluding atmospheric units and thermal fluid heaters. Group II and Group III units are required to meet a NOx emission limit of nine ppm or 0.011 pound per MMBtu. Rule 1146 also establishes that any units fired on non-gaseous fuels, landfill gas, or digester gas are required to meet NOx emission limits of 40 ppm, 25 ppm, or 15 ppm, respectively. Atmospheric units are required to meet a 12 ppm or 0.015 pound per MMBtu NOx emission limit.

The most recent two amendments to Rule 1146 were in September 2008 and November 2013. In the September 2008 amendments to Rule 1146, the allowable NOx emission limits for boilers, steam generators and process heaters were reduced from 30 ppm to either 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. The September 2008 amendments also added NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes included: 1) establishing a weighted average formula for dual fueled co-fired units; 2) allowing existing units to be de-rated to no less than two MMBtu per hour per unit; 3) requiring compliance with a 30 ppm NOx limit for low fuel usage equipment by January 1, 2015 or burner replacement, whichever occurs later; 4) allowing a later compliance date for health facilities complying with seismic safety requirements; 5) establishing a staged compliance schedule over a multi-year period which varies by equipment size range and unit operation; 6) making the frequency of compliance testing compatible with sources subject to the RECLAIM program for the same equipment size range; and 7) allowing NOx emissions monitoring with a portable analyzer. The analysis in the September 2008 Final EA for Rule 1146 concluded that the project would achieve NOx emission reductions of approximately 1.17 tons per day of NOx emissions by 2016 by relying on currently available NOx control technologies (e.g., low NOx burners and SCRs). The September 2008 Final EA for Rule 1146 also concluded that the project would have a significant effect on the environment for air quality during construction (before applying the NOx emission reductions) and hazards and hazardous materials associated with the use and storage of aqueous ammonia. Mitigation measures for the potentially significant hazards and hazardous materials impacts were required and were made a condition of the approval. Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were adopted.

The November 2013 amendments to Rule 1146 addressed a SIP approvability issue that was raised by the U.S. EPA regarding the use of source test data and portable analyzers test results to prove a violation of the emission standard. Also included in the November 2013 amendments were the following minor changes: 1) a clarification that Rules 1146 and 1146.1 do not apply to NOx sources subject to the SCAQMD's Regulation XX – RECLAIM; 2) the identification of certain equipment that are not included under boiler or steam generator category; 3) an enhanced description pertaining to the types of operations that would be subject to Rule 1146; 4) a clarification that low fuel usage equipment are only subject to periodic tune-up requirements; and, 5) a prohibition from derating equipment to a level at or below two million MMBtu per hour. No NOx emission reductions were attributed to the November 2013 amendments to Rule 1146. The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1) and SCAQMD staff concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD

determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. A Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Rule 1146.1

As with Rule 1146, Rule 1146.1 also applies to boilers, steam generators, and process heaters at industrial, institutional, and commercial operations, but for units with a rated heat input capacity greater than two ~~but~~ and less than five MMBtu per hour. Similar to Rule 1146, units using landfill gas or digester gas would also need to meet the NOx emission limit of 25 ppm or 15 ppm, respectively. Atmospheric units would also be required to meet a 12 ppm NOx emission limit. All other units, excluding thermal fluid heaters, fired on natural gas would need to meet a nine ppm or 0.011 pound per MMBtu NOx emission limit.

The most recent two amendments to Rule 1146.1 were also in September 2008 and November 2013. Similar to Rule 1146, but applicable to units with smaller rated heat inputs, the September 2008 amendments to Rule 1146.1 further reduced the NOx emission limits, included new NOx limits for atmospheric units to be 12 ppm or 0.015 pound per MMBtu, and units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. The amendments also: 1) established a weighted average formula for dual fueled co-fired units; 2) allowed existing units to be de-rated to no less than two MMBtu per hour per unit; 3) made the frequency of compliance testing compatible with RECLAIM sources for the same equipment size range; 4) allowed for monitoring of NOx and CO emissions with a portable analyzer; 5) for low-fuel usage units, required compliance with a 30 ppm NOx limit by January 1, 2015 or burner replacement, whichever occurs later; 6) allowed thermal fluid heaters to continue compliance with the 30 ppm NOx limits; and, 7) allowed a later compliance date for health facilities complying with seismic safety requirements. The analysis in the September 2008 Final EA for Rule 1146.1 concluded that the project would achieve NOx emission reductions of approximately 0.28 tons per day by 2015 by relying on currently available NOx control technologies (e.g., low NOx burners). The September 2008 Final EA for Rule 1146.1 identified no significant adverse environmental impacts for any environmental topic areas. Since there were no significant adverse environmental impacts identified, mitigation measures were not required and Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were not adopted.

The November 2013 amendments to Rule 1146.1 were combined with the November 2013 amendments to Rule 1146, and addressed a SIP approvability issue that was raised by the U.S. EPA regarding the use of source test data and portable analyzers test results to prove a violation of the emission standard. Also included in the November 2013 amendments were the following minor changes: 1) a clarification that Rules 1146 and 1146.1 do not apply to NOx sources subject to the SCAQMD's Regulation XX – RECLAIM; 2) the identification of certain equipment that are not included under boiler or steam generator category; 3) an enhanced description pertaining to the types of operations that would be subject to Rule 1146; 4) a clarification that low fuel usage equipment are only subject to periodic tune-up requirements; and, 5) a prohibition from derating equipment to a level at or below two million MMBtu per hour. No NOx emission reductions were attributed to the November 2013 amendments to Rule 1146. The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1) and SCAQMD staff concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption.

A Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Rule 1146.2

Rule 1146.2 addresses natural gas-fired water heaters, boilers, and process heaters less than or equal to two MMBtu per hour. Rule 1146.2 exempts units used in recreational vehicles and units subject to SCAQMD Rule 1121. Rule 1146.2 requires new Type 2 units (rated heat input capacity greater than 400,000 Btu per hour and less than or equal to two MMBtu per hour) and Type 1 (rated heat input capacity less than or equal to 400,000 Btu per hour) to meet a NOx emission limit of 30 ppm and 20 ppm, respectively. Pool heaters rated at less than or equal to 400,000 Btu per hour are required to meet the NOx emission limit of 55 ppm (or 40 ng per J heat output). However, the current amendments to Rule 1146.2 will not require RECLAIM facilities to meet NOx emission limits in Rule 1146.2 by December 31, 2023 unless a more stringent BARCT limit is applicable.

The most recent amendments to Rule 1146.2 occurred in May 2006 and partially offset the NOx emission reductions foregone from the January 2005 amendments to Rule 1146.2. The May 2006 amendments to Rule 1146.2 required: 1) Type 2 units (equipment with heat input ratings greater than 400,000 Btu per hour) to meet a NOx emission limit of 20 ppm on or after January 1, 2010; and 2) Type 1 units (equipment with a heat input rating equivalent to or less than 400,000 Btu per hour) to meet a NOx emission limit of 20 ppm on or after January 1, 2012. Other changes included: 1) providing more detailed specifications for demonstrating compliance with an existing exemption from retrofit requirements for equipment operating less than 9,000 therms per year; 2) clarifying rule applicability; 3) a specific recordkeeping requirement for larger units; 4) enhancing compliance and enforceability; and, 5) improving clarity. The analysis in the May 2006 Final EA for Rule 1146.2 concluded that the project would achieve annual NOx emission reductions beginning in 2010, culminating in an overall reduction of 1.8 tons per day of NOx emissions by January 1, 2027 by relying on currently available NOx control technologies (e.g., low NOx burners). The May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic areas. Since there were no significant adverse environmental impacts identified, mitigation measures were not required and Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were not adopted.

NOx Emission Inventory for Rules 1146, 1146.1 and 1146.2

The total baseline NOx emission inventory for equipment at RECLAIM facilities subject to Rules 1146 and 1146.1 are summarized in Table 3-1 and is estimated to be 0.4136 ton per day based on the SCAQMD RECLAIM inventory database from calendar year 2016. The inventory excludes facilities that would be subject to sector specific command-and-control regulation (electricity generating facilities and refineries). Thirty-two Rule 1146.2 units are currently permitted in the RECLAIM program with most of the units (29 out of 32) meeting the Rule 1146.2 NOx emission limits. ~~Three~~Four of the 32 units do not meet the NOx emission limits and these units would require retrofitting or replacement by December 31, 2023 under the proposed project. However, it is important to note that Rule 1146.2 units are smaller units that are exempt from permitting requirements under Rule 219 -Equipment Not Requiring a Written Permit Pursuant to Regulation II. Non-RECLAIM facilities currently register Rule 1146.2 equipment from one up to and including two MMBtu per hour under Rule 222 - Filing Requirements For Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II. RECLAIM facilities are currently exempt from this provision. Additionally, the RECLAIM NOx emissions for combustion sources not requiring a written permit are reported on a quarterly basis as an aggregate sum for these devices. As a result, the permitted Rule 1146.2 universe may not fully represent the actual

number of Rule 1146.2 units at RECLAIM facilities because the majority of the Rule 1146.2 units in RECLAIM are not currently registered or permitted with SCAQMD. Therefore, it is difficult to establish a precise inventory of the Rule 1146.2 units at RECLAIM facilities at this time. To aid in assessing the baseline emissions for future rulemaking efforts, RECLAIM facilities are required to submit their inventory of all small boilers and process heaters that would be subject to Rule 1146.2 requirements for Type 2 units as part of the initial determination notification process, pursuant to Rule 2002, paragraph (f)(6). The proposed amendments to Rules 1146, 1146.1, and 1146.2 affect a wide variety of RECLAIM facilities. For the lists of industry sectors and number of units affected by the proposed amendments to Rules 1146, 1146.1, and 1146.2, see Table 2-1.

Table 3-1
NOx Baseline Emission Inventory for Rules 1146, 1146.1, and 1146.2 Units in RECLAIM

Category	NOx Baseline Emission Inventory (tons/day)	<u>Number of Affected Units</u>
Rule 1146 – Group I (≥ 75 MMBtu/hour)	0.085	<u>3</u>
Rule 1146 – Group II (≥ 20 to < 75 MMBtu/hour)	0.2149	<u>52</u>
Rule 1146 – Group III (≥ 5 to < 20 MMBtu/hour)	0.10	<u>69</u>
<u>Rule 1146 – Thermal Fluid Heaters</u>	<u>0.0030</u>	<u>2</u>
Rule 1146.1 (> 2 to < 5 MMBtu/hour)	0.0112	<u>19</u>
Rule 1146.2 (≤ 2 MMBtu/hour)	0.008087	<u>3</u>
Total Emission Inventory	0.4236	<u>149</u>

Over half the NOx emissions inventory can be attributed to Rule 1146 units in Group II. The Rule 1146 Group I units contribute to 20~~13~~ percent of NOx baseline emissions, ~~however, on average each unit accounts for more than double the amount of emissions than a Rule 1146 Group II unit.~~ The Rule 1146 Group III units make up 24~~8~~ percent of the emissions inventory, which is equivalent to with 0.10 ton per day of NOx. A majority of the NOx baseline emission inventory comes from larger units subject to Rule 1146. Rule 1146.1 units make up the second majority of NOx baseline emissions inventory. Units subject to Rule 1146.2 make up thea ~~the~~ smallest amount of the emission inventory. Thus, the compliance deadlines as proposed in Rule 1100 are expected to achieve greater NOx emissions reductions earlier from units subject to Rule 1146 and 1146.1.

AIR QUALITY

It is the responsibility of SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, NO₂, PM₁₀, PM_{2.5}, SO₂, and lead. These standards were established to

protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM₁₀ and SO₂, far more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and NAAQS for each of these pollutants and their effects on health are summarized in Table 3-2. SCAQMD monitors levels of various criteria pollutants at 38 monitoring stations. The 2016 air quality data (the latest data available) from SCAQMD's monitoring stations are presented in Table 3-3.

Table 3-2
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard ^a	Federal Primary Standard ^b	Most Relevant Effects
Ozone (O₃)	1-hour	0.09 ppm (180 µg/m ³)	0.12 ppm	(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)	0.070 ppm (137 µg/m ³)	
Suspended Particulate Matter (PM₁₀)	24-hour	50 µg/m ³	150 µg/m ³	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and (b) Excess seasonal declines in pulmonary function, especially in children.
	Annual Arithmetic Mean	20 µg/m ³	No Federal Standard	
Suspended Particulate Matter (PM_{2.5})	24-hour	No State Standard	35 µg/m ³	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and (c) Decreased lung functions and premature death.
	Annual Arithmetic Mean	12 µg/m ³	12 µg/m ³	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
	8-Hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	

Table 3-2 (Concluded)
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard ^a	Federal Primary Standard ^b	Most Relevant Effects
Nitrogen Dioxide (NO₂)	1-Hour	0.18 ppm (339 µg/m ³)	0.100 ppm (188 µg/m ³)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)	
Sulfur Dioxide (SO₂)	1-Hour	0.25 ppm (655 µg/m ³)	75 ppb (196 µg/m ³)–	Broncho-constriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24-Hour	0.04 ppm (105 µg/m ³)	No Federal Standard	
Sulfates	24-Hour	25 µg/m ³	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage
Hydrogen Sulfide (H₂S)	1-Hour	0.03 ppm (42 µg/m ³)	No Federal Standard	Odor annoyance.
Lead (Pb)	30-Day Average	1.5 µg/m ³	No Federal Standard	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction.
	Calendar Quarter	No State Standard	1.5 µg/m ³	
	Rolling 3-Month Average	No State Standard	0.15 µg/m ³	
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standard	The statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. This is a visibility based standard not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent.
Vinyl Chloride	24-Hour	0.01 ppm (26 µg/m ³)	No Federal Standard	Highly toxic and a known carcinogen that causes a rare cancer of the liver.
ppb = parts per billion parts of air, by volume ppm = parts per million parts of air, by volume µg/m ³ = micrograms per cubic meter mg/m ³ = milligrams per cubic meter				

^a The California ambient air quality standards for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, PM₁₀, and PM_{2.5} are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

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

Table 3-3
2016 Air Quality Data – South Coast Air Quality Management District

CARBON MONOXIDE (CO)^a				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm, 8-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	361	1.9	1.4
2	Northwest Coastal Los Angeles County	366	2.2	1.1
3	Southwest Coastal Los Angeles County	362	1.6	1.3
4	South Coastal Los Angeles County 1	--	--	--
4	South Coastal Los Angeles County 2	--	--	--
4	South Coastal Los Angeles County 3	363	3.3	2.2
4	I-710 Near Road ^{##}	--	--	--
6	West San Fernando Valley	366	2.4	1.9
8	West San Gabriel Valley	366	1.5	1
9	East San Gabriel Valley 1	366	1.3	1.2
9	East San Gabriel Valley 2	364	1.1	1
10	Pomona/Walnut Valley	361	1.7	1.3
11	South San Gabriel Valley	366	2.8	1.7
12	South Central Los Angeles County	366	4.4	3.9
13	Santa Clarita Valley	366	1.3	1.1
ORANGE COUNTY				
16	North Orange County	366	3.1	1.5
17	Central Orange County	355	2.6	2.1
17	I-5 Near Road ^{##}	360	3.7	2.2
18	North Coastal Orange County	366	2.1	1.7
19	Saddleback Valley	353	1.3	0.7
RIVERSIDE COUNTY				
22	Corona/Norco Area	--	--	--
23	Metropolitan Riverside County 1	359	1.7	1.3
23	Metropolitan Riverside County 3	366	1.9	1.4
24	Perris Valley	--	--	--
25	Elsinore Valley	298*	1.2	0.6
26	Temecula Valley	--	--	--
29	San Geronio Pass	--	--	--
30	Coachella Valley 1**	361	3.1	1.5
30	Coachella Valley 2**	--	--	--
30	Coachella Valley 3**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	366	1.7	1.3
33	I-10 Near Road ^{##}	366	1.7	1.3
33	CA-60 Near Road ^{##}	--	--	--
34	Central San Bernardino Valley 1	359	1.7	1
34	Central San Bernardino Valley 2	358	2.2	1.7
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			4.4	3.9
SOUTH COAST AIR BASIN			4.4	3.9
ppm = parts per million -- = Pollutant not monitored ^{##} = Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.				
			**Salton Sea Air Basin *Incomplete Data	

^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 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

OZONE (O3)										
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hr	Max. Conc. in ppm 8-hr	4th High Conc. ppm 8-hr	No. Days Standard Exceeded				
						Federal			State	
						Old > 0.124 ppm 1-hr	Current > 0.070 ppm 8-hr*	2008 > 0.075 ppm 8-hr	Current > 0.09 ppm 1-hr	Current > 0.070 ppm 8-hr
LOS ANGELES COUNTY										
1	Central LA	364	0.103	0.078	0.071	0	4	1	2	4
2	Northwest Coastal LA County	365	0.085	0.073	0.066	0	2	0	0	2
3	Southwest Coastal LA County	361	0.087	0.08	0.067	0	2	1	0	3
4	South Coastal LA County 1	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 2	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 3	365	0.079	0.059	0.055	0	0	0	0	0
4	I-710 Near Road ^{##}	--	--	--	--	--	--	--	--	--
6	West San Fernando Valley	364	0.122	0.098	0.086	0	23	14	9	23
8	West San Gabriel Valley	358	0.126	0.09	0.082	1	18	15	12	19
9	East San Gabriel Valley 1	366	0.146	0.106	0.095	4	39	25	30	40
9	East San Gabriel Valley 2	362	0.148	0.114	0.098	6	52	31	38	55
10	Pomona/Walnut Valley	360	0.127	0.092	0.087	1	26	14	20	29
11	South San Gabriel Valley	359	0.111	0.081	0.074	0	6	2	9	6
12	South Central LA County	365	0.098	0.071	0.064	0	1	0	1	1
13	Santa Clarita Valley	366	0.13	0.115	0.1	2	57	35	29	59
ORANGE COUNTY										
16	North Orange County	365	0.103	0.078	0.075	0	6	3	3	7
17	Central Orange County	354	0.103	0.074	0.071	0	4	0	2	4
17	I-5 Near Road ^{##}	--	--	--	--	--	--	--	--	--
18	North Coastal Orange County	366	0.09	0.069	0.065	0	0	0	0	0
19	Saddleback Valley	365	0.122	0.093	0.079	0	13	6	5	13
RIVERSIDE COUNTY										
22	Corona/Norco Area	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	357	0.142	0.104	0.097	1	69	47	33	71
23	Metropolitan Riverside County 3	365	0.14	0.106	0.095	1	65	43	34	70
24	Perris Valley	366	0.131	0.098	0.092	1	55	30	23	56
25	Elsinore Valley	360	0.124	0.093	0.087	0	44	25	15	45
26	Temecula Valley	355	0.092	0.081	0.077	0	19	6	0	20
29	San Gorgonio Pass	358	0.128	0.106	0.094	1	52	39	26	54
30	Coachella Valley 1**	363	0.103	0.092	0.087	0	46	20	6	48
30	Coachella Valley 2**	331	0.099	0.089	0.081	0	27	12	3	29
30	Coachella Valley 3**	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY										
32	Northwest San Bernardino Valley	366	0.156	0.116	0.11	10	88	65	53	89
33	I-10 Near Road ^{##}	--	--	--	--	--	--	--	--	--
33	CA-60 Near Road ^{##}	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	362	0.139	0.105	0.098	3	49	39	34	52
34	Central San Bernardino Valley 2	366	0.158	0.118	0.114	10	106	76	70	108
35	East San Bernardino Valley	364	0.145	0.119	0.103	3	97	71	55	100
37	Central San Bernardino Mountains	365	0.163	0.121	0.116	9	101	80	64	103
38	East San Bernardino Mountains	--	--	--	--	--	--	--	--	--
DISTRICT MAXIMUM			0.163	0.121	0.116	10	106	80	70	108
SOUTH COAST AIR BASIN			0.163	0.121	0.116	17	132	103	83	132
ppm = parts per million -- = Pollutant not monitored ## = Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.										
**Salton Sea Air Basin *Incomplete data										

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

NITROGEN DIOXIDE (NO ₂) ^b					
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	1-hour Max. Conc. ppb, 1,	1-hour 98 th Percentile Conc. ppb,	Annual Average AAM Conc. ppb
LOS ANGELES COUNTY					
1	Central LA	366	64.7	61	20.8
2	Northwest Coastal LA County	366	54.5	49.3	11.6
3	Southwest Coastal LA County	348	81.5	54.7	10.1
4	South Coastal LA County 1	--	--	--	--
4	South Coastal LA County 2	--	--	--	--
4	South Coastal LA County 3	366	75.6	66.3	18.5
4	I-710 Near Road ^{##}	366	95.3	76.6	23.9
6	West San Fernando Valley	355	55.5	45.9	12.9
8	West San Gabriel Valley	366	71.9	58.4	15.4
9	East San Gabriel Valley 1	366	74.2	58.3	16.6
9	East San Gabriel Valley 2	365	65.4	45.7	11.6
10	Pomona/Walnut Valley	360	69.3	62.5	20.1
11	South San Gabriel Valley	361	63.2	60.1	20
12	South Central LA County	366	63.7	58.4	15.6
13	Santa Clarita Valley	361	46.4	39.4	10.2
ORANGE COUNTY					
16	North Orange County	359	60.4	51.5	14.7
17	Central Orange County	354	64.3	56.7	14.8
17	I-5 Near Road ^{##}	357	75.2	60.1	23.4
18	North Coastal Orange County	349	59.8	51.2	10.1
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Corona/Norco Area	--	--	--	--
23	Metropolitan Riverside County 1	366	73.1	52.2	14.9
23	Metropolitan Riverside County 3	366	64.9	48.3	13.6
24	Perris Valley	--	--	--	--
25	Elsinore Valley	345*	51.3	35.6	8.1
26	Temecula Valley	--	--	--	--
29	San Geronio Pass	348	46.9	42.6	7.9
30	Coachella Valley 1**	363	42.6	34.4	6
30	Coachella Valley 2**	--	--	--	--
30	Coachella Valley 3**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	366	70.1	55.1	16.5
33	I-10 Near Road ^{##}	362	93.4	74.3	29.3
33	CA-60 Near Road ^{##}	361	89.8	71.3	31
34	Central San Bernardino Valley 1	357	71.7	56.4	18.2
34	Central San Bernardino Valley 2	355	60.1	51.4	16.6
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM			95.3	76.6	31
SOUTH COAST AIR BASIN			95.3	76.6	31
ppb = parts per billion AAM = Annual Arithmetic Mean ## = Four near-road sites measuring one or more of the pollutants PM _{2.5} , CO, and/or NO ₂ are operating near the following freeways: I-1, I-10, CA-60, and I-710.					
-- = Pollutant not monitored **Salton Sea Air Basin					

^b The NO₂ federal 1-hour standard is 100 ppb and the annual standard is annual arithmetic mean NO₂ > 0.0534 ppm (53.4 ppb). The state 1-hour and annual standards are 0.18 ppm (180 ppb) and 0.030 ppm (30 ppb).

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

SULFUR DIOXIDE (SO₂)^c				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Conc. ppb, 1-hour	99 th Percentile Conc. ppb, 1-hour
LOS ANGELES COUNTY				
1	Central LA	366	13.4	2.5
2	Northwest Coastal LA County	--	--	--
3	Southwest Coastal LA County	363	9.7	5.7
4	South Coastal LA County 1	--	--	--
4	South Coastal LA County 2	--	--	--
4	South Coastal LA County 3	366	17.8	12
4	I-710 Near Road ^{##}	--	--	--
6	West San Fernando Valley	--	--	--
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 LA County	--	--	--
13	Santa Clarita Valley	--	--	--
ORANGE COUNTY				
16	North Orange County	--	--	--
17	Central Orange County	--	--	--
17	I-5 Near Road ^{##}	--	--	--
18	North Coastal Orange County	366	3.3	2.1
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Corona/Norco Area	--	--	--
23	Metropolitan Riverside County 1	366	5.6	2
23	Metropolitan Riverside County 3	--	--	--
24	Perris Valley	--	--	--
25	Elsinore Valley	--	--	--
26	Temecula Valley	--	--	--
29	San Geronio Pass	--	--	--
30	Coachella Valley 1**	--	--	--
30	Coachella Valley 2**	--	--	--
30	Coachella Valley 3**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	--	--	--
33	I-10 Near Road ^{##}	--	--	--
33	CA-60 Near Road ^{##}	--	--	--
34	Central San Bernardino Valley 1	363	6.3	2
34	Central San Bernardino Valley 2	--	--	--
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			17.8	12
SOUTH COAST AIR BASIN			17.8	12
ppb = parts per billion -- = Pollutant not monitored ## = Four near-road sites measuring one or more of the pollutants PM _{2.5} , CO, and/or NO ₂ are operating near the following freeways: I-1, I-10, CA-60, and I-710.				

^c The federal SO₂ 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO₂ > 0.25 ppm (250 ppb) and 24-hour average SO₂ > 0.04 ppm (40 ppb).

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM10 ^d						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. µg/m ³ , 24-hour	No. (%) Samples Exceeding Standard		Annual Average AAM Conc. ^e µg/m ³
				Federal > 150 µg/m ³ , 24-hour	State > 50 µg/m ³ , 24-hour	
LOS ANGELES COUNTY						
1	Central LA	277*	67	0	18(6%)	32.4
2	Northwest Coastal LA County	--	--	--	--	--
3	Southwest Coastal LA County	60	43	0	0(0%)	21.6
4	South Coastal LA County 1	--	--	--	--	--
4	South Coastal LA County 2	60	56	0	3(5%)	27.8
4	South Coastal LA County 3	59	75	0	8(14%)	31.9
4	I-710 Near Road ^{##}	--	--	--	--	--
6	West San Fernando Valley	--	--	--	--	--
8	West San Gabriel Valley	--	--	--	--	--
9	East San Gabriel Valley 1	60	74	0	12(20%)	33.7
9	East San Gabriel Valley 2	362	74	0	21(6%)	29.8
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	--	--	--	--	--
12	South Central LA County	--	--	--	--	--
13	Santa Clarita Valley	60	96	0	1(2%)	23.4
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	353	74	0	3(1%)	24.4
17	I-5 Near Road ^{##}	--	--	--	--	--
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	59	59	0	1(2%)	21
RIVERSIDE COUNTY						
22	Corona/Norco Area	51*	62	0	7(14%)	31.7
23	Metropolitan Riverside County 1	302*	82	0	58(19%)	36.9
23	Metropolitan Riverside County 3	356 ⁺	116	0	175(49%)	49
24	Perris Valley	57	76	0	5(9%)	32.2
25	Elsinore Valley	366	99	0	4(1%)	21.4
26	Temecula Valley	--	--	--	--	--
29	San Gorgonio Pass	57	65	0	3(5%)	24
30	Coachella Valley 1 ^{**}	355 ⁺	113	0	6(2%)	20.8
30	Coachella Valley 2 ^{**}	313 ^{**}	137	0	56(18%)	36.9
30	Coachella Valley 3 ^{**}	272 ^{**}	150	0	76(28%)	43
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	363	72	0	5(1%)	25
33	I-10 Near Road ^{##}	--	--	--	--	--
33	CA-60 Near Road ^{##}	--	--	--	--	--
34	Central San Bernardino Valley 1	61	94	0	15(25%)	38.1
34	Central San Bernardino Valley 2	333*	91	0	33(10%)	33.1
35	East San Bernardino Valley	56	72	0	4(7%)	27.8
37	Central San Bernardino Mountains	61	46	0	0(0%)	17.1
38	East San Bernardino Mountains	--	--	--	--	--
DISTRICT MAXIMUM			150 ⁺	0 ⁺	175 ⁺	49.0 ⁺
SOUTH COAST AIR BASIN			116 ⁺	0 ⁺	181 ⁺	49.0 ⁺
µg/m ³ = micrograms per cubic meter of air			^{##} = Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.			
AAM = Annual Arithmetic Mean			⁺ = High PM10 (≥ 155 µg/m ³) data recorded in Coachella Valley (due to high winds) and the Basin (due to Independence Day fireworks) are excluded in accordance with the U.S. EPA Exceptional Event Rule.			
-- = Pollutant not monitored						
^{**} Salton Sea Air Basin						
*Incomplete Data						

^d Federal Reference Method (FRM) PM10 samples were collected every 6 days at all sites except for Stations 4144 and 4157, where samples were collected every 3 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 152 µg/m3, at Indio.

^e State standard is annual average (AAM) > 20 µg/m3. Federal annual PM10 standard (AAM > 50 µg/m3) was revoked in 2006.

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

SUSPENDED 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	98 th 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 LA	357	44.39	27.3	2(0.6%)	11.83
2	Northwest Coastal LA County	--	--	--	--	--
3	Southwest Coastal LA County	--	--	--	--	--
4	South Coastal LA County 1	356	29.37	23.56	0	10.36
4	South Coastal LA County 2	350	28.93	22.05	0	9.62
4	South Coastal LA County 3	--	--	--	--	--
4	I-710 Near Road ^{##}	352	33.31	26.09	0	12.03
6	West San Fernando Valley	113	30.05	24.59	0	9.23
8	West San Gabriel Valley	119	29.21	25.38	0	9.59
9	East San Gabriel Valley 1	122	32.17	29.01	0	10.15
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	120	46.59	25.13	2(1.7%)	11.75
12	South Central LA County	115	36.35	26.35	1(0.9%)	11.13
13	Santa Clarita Valley	--	--	--	--	--
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	349	44.45	24.02	1(0.3%)	9.47
17	I-5 Near Road ^{##}	--	--	--	--	--
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	117	24.79	13.41	0	7.36
RIVERSIDE COUNTY						
22	Corona/Norco Area	--	--	--	--	--
23	Metropolitan Riverside County 1	357 ⁺	39.12	31.65	4(1.1%)	12.54
23	Metropolitan Riverside County 3	352 ⁺	45.64	35.14	6(1.7%)	14.02
24	Perris Valley	--	--	--	--	--
25	Elsinore Valley	--	--	--	--	--
26	Temecula Valley	--	--	--	--	--
29	San Geronio Pass	--	--	--	--	--
30	Coachella Valley 1 ^{**}	112	14.71	12.43	0	5.53
30	Coachella Valley 2 ^{**}	115	25.84	15.04	0	7.74
30	Coachella Valley 3 ^{**}	--	--	--	--	--
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	--	--	--	--	--
33	I-10 Near Road ^{##}	--	--	--	--	--
33	CA-60 Near Road ^{##}	347 ⁺⁺	44.14	33.02	6(1.7%)	14.73
34	Central San Bernardino Valley 1	111 ⁺	30.45	26.25	0	12.04
34	Central San Bernardino Valley 2	113 ⁺	32.54	27.12	0	10.84
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	55	28.42	22.14	0	6.83
DISTRICT MAXIMUM			46.6⁺	35.1⁺	6⁺	14.73⁺
SOUTH COAST AIR BASIN			46.6⁺	35.1⁺	9⁺	14.73⁺
^f µg/m ³ = micrograms per cubic meter of air AAM = Annual Arithmetic Mean -- = Pollutant not monitored ^{**} Salton Sea Air Basin [*] Incomplete Data ^{##} = Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710 ⁺⁺ = High PM10 (≥ 155 µg/m ³) data recorded in Coachella Valley (due to high winds) and the Basin (due to Independence Day fireworks) are excluded in accordance with the U.S. EPA Exceptional Event Rule.						

^f PM2.5 samples were collected every 3 days at all sites except for station numbers 072, 077, 087, 3176, 4144 and 4165, where samples were taken daily, and station number 5818 where samples were taken every 6 days. PM2.5 statistics listed above are for the FRM data only. FEM PM2.5 continuous monitoring instruments were operated at some of the above locations for special purposes studies.

^g Both federal and state standards are annual average (AAM) > 12.0 µg/m³.

Table 3-3 (Concluded)
2016 Air Quality Data – South Coast Air Quality Management District

		LEAD ^h		SULFATES (SOx) ⁱ	
Source Receptor Area No.	Location of Air Monitoring Station	Max. Monthly Average Conc. ^{m)} µg/m ³	Max. 3-Month Rolling Average ^{m)} µg/m ³	No. Days of Data	Max. Conc. µg/m ³ , 24-hour
LOS ANGELES COUNTY					
1	Central LA	0.016	0.01	58	5.8
2	Northwest Coastal LA County	--	--	--	--
3	Southwest Coastal LA County	0.006	0.01	58	6.2
4	South Coastal LA County 1	--	--	--	--
4	South Coastal LA County 2	0.008	0.01	59	6.3
4	South Coastal LA County 3	--	--	57	7.4
4	I-710 Near Road ^{##}	--	--	--	--
6	West San Fernando Valley	--	--	--	--
8	West San Gabriel Valley	--	--	--	--
9	East San Gabriel Valley 1	--	--	58	9.5 [#]
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.011	0.01	--	--
12	South Central LA County	0.016	0.01	--	--
13	Santa Clarita Valley	--	--	59	4.1
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	59	5.3 [#]
17	I-5 Near Road ^{##}	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	58	3.7
RIVERSIDE COUNTY					
22	Corona/Norco Area	--	--	50	8.2 [#]
23	Metropolitan Riverside County 1	0.007	0.01	114	15.2 [#]
23	Metropolitan Riverside County 3	--	--	118	13.6 [#]
24	Perris Valley	--	--	55	6.0 [#]
25	Elsinore Valley	--	--	--	--
26	Temecula Valley	--	--	--	--
29	San Gorgonio Pass	--	--	56	4.0 [#]
30	Coachella Valley 1 ^{**}	--	--	51	3.9
30	Coachella Valley 2 ^{**}	--	--	113	4.1
30	Coachella Valley 3 ^{**}	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	0.007	0.01	--	--
33	I-10 Near Road ^{##}	--	--	--	--
33	CA-60 Near Road ^{##}	--	--	--	--
34	Central San Bernardino Valley 1	--	--	59	17.1 [#]
34	Central San Bernardino Valley 2	0.01	0.01	55	16.0 [#]
35	East San Bernardino Valley	--	--	56	12.1 [#]
37	Central San Bernardino Mountains	--	--	59	3.9 [#]
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		0.016 ⁺⁺	0.01 ⁺⁺	17.1 [#]	
SOUTH COAST AIR BASIN		0.016 ⁺⁺	0.01 ⁺⁺	17.1 [#]	
µg/m³ = micrograms per cubic meter of air -- =Pollutant not monitored **Salton Sea Air Basin *Incomplete Data ^{##} = Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710. + = High PM10 (≥ 155 µg/m³) data recorded in Coachella Valley (due to high winds) and the Basin (due to Independence Day fireworks) are excluded in accordance with the U.S. EPA Exceptional Event Rule. ++ = Higher lead concentrations were recorded at near-source monitoring sites immediately downwind of stationary lead sources. Maximum monthly and 3-month rolling averages recorded were 0.88 µ/m³ and 0.06 µ/m³.					

^h Federal lead standard is 3-months rolling average > 0.15 µg/m³; state standard is monthly average ≥ 1.5 µg/m³. Lead standards were not exceeded.

ⁱ Sulfate data is not available at this time. State sulfate standard is 24-hour ≥ 25 µg/m³. There is no federal standard for sulfate.

Carbon Monoxide

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, 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 preterm births and heart abnormalities.

CO concentrations were measured at 25 locations in the Basin and neighboring Salton Sea Air Basin areas in 2016. CO concentrations did not exceed the standards in 2016. The highest 1-hour average CO concentration recorded (4.4 ppm in the South Central Los Angeles County area) was 13 percent of the federal 1-hour CO standard of 35 ppm and 22 percent of the state 1-hour standard of 20 ppm. The highest 8-hour average CO concentration recorded (3.9 ppm in the South Central Los Angeles County area) was 43 percent of the federal and state 8-hour CO standard of 9.0 ppm.

In 2004, SCAQMD formally requested the U.S. EPA to re-designate the Basin from nonattainment to attainment with the CO NAAQS. On March 24, 2007, U.S. EPA published in the Federal Register its proposed decision to re-designate the Basin from nonattainment to attainment for CO. The comment period on the re-designation proposal closed on March 16, 2007 with no comments received by the U.S. EPA. On May 11, 2007, U.S. EPA published in the Federal Register its final decision to approve SCAQMD's request for re-designation from non-attainment to attainment for CO, effective June 11, 2007.

On August 12, 2011 U.S. EPA issued a decision to retain the existing NAAQS for CO, determining that those standards provided the required level of public health protection. However, U.S. EPA added a monitoring requirement for near-road CO monitors in urban areas with population of one million or more, utilizing stations that would be implemented to meet the 2010 NO₂ near-road monitoring requirements. The two new CO monitors are at the I-5 near-road site, located in Orange

County near Anaheim, and the I-10 near-road site, located near Etiwanda Avenue in San Bernardino County near Ontario, Rancho Cucamonga, and Fontana.

Ozone

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

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

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

Ozone exposure under exercising conditions is known to increase the severity of the above mentioned 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 2016, SCAQMD regularly monitored ozone concentrations at 29 locations in the Basin and the Coachella Valley portion of the Salton Sea Air Basin. Maximum ozone concentrations (fourth highest concentration ppm 8-hour) for all areas monitored were below the stage 1 episode level (0.20 ppm) and below the health advisory level (0.15 ppm) (see Table 3-3). All counties in the Basin, as well as the Coachella Valley, exceeded the level of the new 2015 (0.070 ppm), the former 2008 (0.075 ppm), and/or the 1997 (0.08 ppm) 8-hour ozone NAAQS in 2016. While not all stations had days exceeding the previous 8-hour standards, all monitoring stations except two (South Coastal LA County 3 and North Coastal Orange County) had at least one day over the 2015 federal ozone standard (70 ppb).

In 2016, the maximum ozone concentrations in the Basin continued to exceed federal standards by wide margins. Maximum 1-hour and 8-hour average ozone concentrations were 0.163 ppm and

0.121 ppm, respectively (the maximum 1-hour and 8-hour average was recorded in the Central San Bernardino Mountain area). The maximum 8-hour concentration of 0.121 ppm was 173 percent of the new federal standard (0.070 ppm). The maximum 1-hour concentration was 181 percent of the 1-hour state ozone standard of 0.09 ppm. The 8-hour average concentration was 173 percent of the 8-hour state ozone standard of 0.070 ppm.

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 NO_x. 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 PM_{2.5} 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 subgroups. 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 2016, nitrogen dioxide concentrations were monitored at 27 locations. No area of the Basin or SSAB exceeded the federal or state standards for NO₂. The Basin has not exceeded the federal standard for NO₂ (0.0534 ppm) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any county within the United States. The current 1-hour average NO₂ NAAQS (100 ppb) was last exceeded on two days in 2014 in the South Coastal Los Angeles County area at the Long Beach-Hudson air monitoring station. However, the 98th percentile form of the standard was not exceeded, and the 2013-2015 design value is not in violation of the NAAQS. The higher relative concentrations in the Los Angeles area are indicative of the concentrated emission sources, especially heavy-duty vehicles. NO_x emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM_{2.5} and PM₁₀) concentrations.

With the revised NO₂ federal standard in 2010, near-road NO₂ measurements were required to be phased in for larger cities. The four near-road monitoring stations are: (1) I-5 near-road, located

in Orange County near Anaheim; (2) I-710 near-road, located at Long Beach Blvd. in Los Angeles County near Compton and Long Beach; (3) SR-60 near-road, located west of Vineyard Avenue near the San Bernardino/Riverside County border near Ontario, Mira Loma, and Upland; and (4) I-10 near-road, located near Etiwanda Avenue in San Bernardino County near Ontario, Rancho Cucamonga, and Fontana.

The longest operating near-road station in the Basin, adjacent to I-5 in Orange County, has not exceeded the level of the 1-hour NO₂ NAAQS (100 ppb) since the measurements began on January 1, 2014. The peak 1-hour NO₂ concentration at that site in 2014 was 78.8 ppb and the peak concentration for 2015 was 70.2 ppb. This can be compared to the annual peak values measured at the nearest ambient monitoring station in Central Orange County (Anaheim station), where the 2014 and 2015 peaks were 75.8 and 59.1, respectively.

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 PM_{2.5}. Most of the SO₂ emitted into the atmosphere is produced by burning sulfur-containing fuels.

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

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

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

No exceedances of federal or state standards for sulfur dioxide occurred in 2016 at any of the six locations monitored the Basin. The maximum 1-hour SO₂ concentration was 17.8 ppb, as recorded in the South Coastal Los Angeles County area. The 99th percentile of 1-hour SO₂ concentration was 12 ppb, as recorded in South Coastal Los Angeles County area. Though SO₂ concentrations remain well below the standards, SO₂ is a precursor to sulfate, which is a component of fine particulate matter, PM₁₀, and PM_{2.5}. Historical measurements showed concentrations to be well below standards and monitoring has been discontinued.

Particulate Matter (PM10 and PM2.5)

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter (PM10)) 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 (PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks, and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by 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 preexisting respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM10 and PM2.5.

SCAQMD monitored PM10 concentrations at 23 locations in 2016. The federal 24-hour PM10 standard (150 $\mu\text{g}/\text{m}^3$) was not exceeded in 2016. The Basin has remained in attainment of the PM10 NAAQS since 2006. The maximum three-year average 24-hour PM10 concentration of 150 $\mu\text{g}/\text{m}^3$ was recorded in the Coachella Valley area and was 100 percent of the federal standard and 300 percent of the much more stringent state 24-hour PM10 standard (50 $\mu\text{g}/\text{m}^3$). The state 24-hour PM10 standard was exceeded at several of the monitoring stations. The maximum annual average PM10 concentration of 49 $\mu\text{g}/\text{m}^3$ was recorded in Metropolitan Riverside County. The federal annual PM10 standard has been revoked. The much more stringent state annual PM10 standard (20 $\mu\text{g}/\text{m}^3$) was exceeded in most stations in each county in the Basin and in the Coachella Valley.

In 2016, PM2.5 concentrations were monitored at 19 locations throughout the Basin. U.S. EPA revised the federal 24-hour PM2.5 standard from 65 $\mu\text{g}/\text{m}^3$ to 35 $\mu\text{g}/\text{m}^3$, effective December 17, 2006. In 2016, the maximum PM2.5 concentrations in the Basin exceeded the new federal 24-hour PM2.5 standard in seven out of 19 locations. The maximum 24-hour PM2.5 concentration of 46.6 $\mu\text{g}/\text{m}^3$ was recorded in the South San Gabriel Valley area. The 98th percentile 24-hour PM2.5 concentration of 35.1 $\mu\text{g}/\text{m}^3$ was recorded in the Metropolitan Riverside County, which barely exceeds the federal standard of 35 $\mu\text{g}/\text{m}^3$. The maximum annual average concentration of 14.73 $\mu\text{g}/\text{m}^3$ was recorded in San Bernardino County, which represents 98 percent of the 2006 federal standard of 15 $\mu\text{g}/\text{m}^3$.

On December 14, 2012, U.S. EPA strengthened the annual NAAQS for PM2.5 to 12 $\mu\text{g}/\text{m}^3$ and, as part of the revisions, a requirement was added to monitor near the most heavily trafficked

roadways in large urban areas. Particle pollution is expected to be higher along these roadways as a result of direct emissions from cars and heavy-duty diesel trucks and buses. SCAQMD has installed the two required PM_{2.5} monitors by January 1, 2015, at locations selected based upon the existing near-roadway NO₂ sites that were ranked higher for heavy-duty diesel traffic. The locations are: (1) I-710, located at Long Beach Blvd. in Los Angeles County near Compton and Long Beach; and (2) SR-60, located west of Vineyard Avenue near the San Bernardino/Riverside County border near Ontario, Mira Loma, and Upland. These near-road sites measure PM_{2.5} daily with FRM filter-based measurements.

Lead

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

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

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

The state standards for lead were not exceeded in any area of the SCAQMD in 2016. There have been no violations of these standards at SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. However, monitoring at two stations immediately adjacent to stationary sources of lead recorded exceedances of the standard in Los Angeles County over the 2007-2009-time period. These data were used for designations under the revised standard that also included new requirements for near-source monitoring. As a result, a nonattainment designation was finalized for much of the Los Angeles County portion of the Basin when the current standard was implemented.

The current lead concentrations in Los Angeles County are now below the NAAQS. The maximum quarterly average lead concentration (0.01 µg/m³ at several monitoring) was seven percent of the federal quarterly average lead standard (0.15 µg/m³). The maximum monthly average lead concentration (0.016 µg/m³ in South Central Los Angeles County) was one percent of the state monthly average lead standard. As a result of the 2012-2014 design value below the NAAQS, SCAQMD will be requesting that U.S. EPA re-designate the nonattainment area as attaining the federal lead standard. Stringent SCAQMD rules governing lead-producing sources will help to ensure that there are no future violations of the federal standard. Furthermore, one

business that had been responsible for the highest measured lead concentrations in Los Angeles County has closed and is in the process of demolition and site clean-up.

Sulfates

Sulfates 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 then contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM₁₀ and PM_{2.5}.

Most of the health effects associated with fine particles and SO₂ at ambient levels are also associated with sulfates. Thus, both mortality and morbidity effects have been observed with an increase in ambient sulfate concentrations. However, efforts to separate the effects of sulfates 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 nonacidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

The most current preliminary data available for sulfates is for 2016. In 2016, the state 24-hour sulfate standard (25 µg/m³) was not exceeded in any of the 19 monitoring locations in the Basin. The maximum 24-hour sulfate concentration was 17.1 ppb, as recorded in the Central San Bernardino Valley. There are no federal sulfate standards.

Vinyl Chloride

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

In the past, vinyl chloride emissions have been associated primarily with sources such as landfills. Risks from exposure to vinyl chloride are considered to be localized impacts rather than regional impacts. Because landfills in the SCAQMD are subject to Rule 1150.1 – Control of Gaseous Emissions from Municipal Solid Waste Landfills, which contain stringent requirements for landfill

gas collection and control, potential vinyl chloride emissions are expected to be below the level of detection. Therefore, SCAQMD does not monitor for vinyl chloride at its monitoring stations.

Volatile Organic Compounds

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

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

Non-Criteria Pollutants

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

In addition to promulgating non-criteria pollutant rules, 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.

Air Quality – Toxic Air Contaminants (TACs)

Federal

Under Section 112 of the CAA, U.S. EPA is required to regulate sources that emit one or more of the 187 federally listed hazardous air pollutants (HAPs). HAPs are toxic air pollutants identified

in the CAA, which are known or suspected of causing cancer or other serious health effects. The federal HAPs are listed on the U.S. EPA website at <http://www.epa.gov/ttn/atw/orig189.html>. In order to implement the CAA, approximately 100 National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been promulgated by U.S. EPA for major sources (sources emitting greater than 10 ton per year (tpy) of a single HAP or greater than 25 tpy of multiple HAPs). 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 Basin that are controlled, many of the sources that would have been subject to federal requirements already comply or are exempt.

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

The federal toxics program recognizes diesel engine exhaust (diesel particulate matter or DPM) as a health hazard; however, DPM itself is not one of their listed TACs. Rather, each toxic compound in the speciated list of compounds in exhaust is considered separately. Although there are no specific NESHAP regulations for DPM, DPM 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 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 ATCMs are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 188 federal hazardous air pollutants (HAPs) as TACs.

ATCMs are developed by CARB and implemented by SCAQMD and other air districts through the adoption of regulations of equal or greater stringency. Generally, the ATCMs reduce emissions to achieve exposure levels below a determined health threshold. If no such threshold levels are determined, emissions are reduced to the lowest level achievable through the best available control

technology unless it is determined that an alternative level of emission reduction is adequate to protect public health.

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

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 statewide 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 SCAQMD. Phase I consists of facilities that emit over 25 tpy of any criteria pollutant and facilities present on SCAQMD's toxics list. Phase I facilities entered the program by reporting their TAC emissions for calendar year 1989. Phase II consists of facilities that emit between 10 and 25 tpy 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 tpy 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 (Diesel Risk Reduction Plan), which was adopted in September 2000 (<http://www.arb.ca.gov/diesel/documents/rrpapp.htm>) with the goal of reducing DPM emissions from compression ignition engines and associated health risk by 75 percent by 2010 and 85 percent by 2020. The Diesel Risk Reduction Plan 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 DPM emissions from mobile sources such as trucks, buses, construction equipment, locomotives, and ships.

OEHHA Health Risk Assessment Guidelines: In 2003, OEHHA developed and approved its Health Risk Assessment Guidance document (2003 OEHHA Guidelines) and prepared a series of Technical Support Documents, reviewed and approved by the Scientific Review Panel (SRP), that provided new scientific information showing that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. As a result, OEHHA developed the Revised OEHHA Guidelines in March 2015, which incorporated this new scientific information. The new method

utilizes higher estimates of cancer potency during early life exposures. There are also differences in the assumptions on breathing rates and length of residential exposures.

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 emissions 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 SCAQMD's toxic regulatory program there are 26 source-specific rules that target toxic emission reductions that regulate over 10,000 sources such as metal finishing, spraying operations, dry cleaners, film cleaning, gasoline dispensing, and diesel-fueled stationary engines to name a few. In addition, other source-specific rules targeting criteria pollutant reductions also reduce toxic emissions, such as Rule 461 – Gasoline Transfer and Dispensing, which reduces benzene emissions from gasoline dispensing, and 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 SCAQMD are subject to Rule 1401 - New Source Review (NSR) of Toxic Air Contaminants and Rule 212 - Standards for Approving Permits. Rule 212 requires notification of 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 a 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 quarter mile radius, or other area deemed appropriate by SCAQMD. Rule 1401 currently controls emissions of carcinogenic and non-carcinogenic (health effects other than cancer) air contaminants from new, modified and relocated sources by specifying limits on cancer risk and hazard index (explained further in the following discussion), respectively. The rule lists nearly 300 TACs that are evaluated during SCAQMD's permitting process for new, modified, or relocated sources. During the past decade, more than ten compounds have been added or had risk values amended. The addition of DPM from diesel-fueled internal combustion engines as a TAC in March 2008 was the most significant of recent amendments to the rule. Rule 1401.1 – 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: On March 17, 2000, the SCAQMD Governing Board approved the Air Toxics Control Plan (2000 ATCP), which was the first comprehensive plan in the nation to guide future toxic rulemaking and programs. The ATCP was developed to lay out 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 SIP measures. The concept for the plan was an outgrowth of the Environmental Justice principles and the Environmental Justice Initiatives adopted by SCAQMD Governing Board on October 10, 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 SCAQMD. The plan proposed control strategies to reduce TACs in the SCAQMD implemented between years 2000 and 2010 through cooperative efforts of SCAQMD, local governments, CARB, and U.S. EPA.

Cumulative Impact Reduction Strategies (CIRS): The CIRS was presented to the SCAQMD Governing Board on September 5, 2003, as part of the White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions. The resulting 25 cumulative impacts strategies were a key element of the Addendum to March 2000 Final Draft Air Toxics Control Plan for Next Ten Years (2004 Addendum). The strategies included rules, policies, funding, education, and cooperation with other agencies. Some of the key SCAQMD accomplishments related to the cumulative impacts reduction strategies were:

- Rule 1401.1, which set more stringent health risk requirements for new and relocated facilities near schools
- Rule 1470 – Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines, which established DPM emission limits and other requirements for diesel-fueled engines
- Rule 1469.1 – Spraying Operations Using Coatings Containing Chromium, which regulated chrome spraying operations
- Rule 410 – Odor 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: The 2004 Addendum was adopted by the SCAQMD Governing Board on April 2, 2004, and served as a status report regarding implementation of the various mobile and stationary source strategies in the 2000 ATCP and introduced new measures to further address air toxics. The main elements of the 2004 Addendum were to address the progress made in the implementation of the 2000 ATCP control strategies; provide a historical perspective of air toxic emissions and current air toxic levels; incorporate the CIRS approved 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 SCAQMD strategies from the 2000 ATCP and the 2004 Addendum. CARB has also made notable progress in mobile source measures via its Diesel Risk Reduction Plan, especially for goods movement related sources, while the U.S. EPA continued to implement their air toxic programs applicable to stationary sources.

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 ATCP and the 2004 Addendum. The objective of the 2010 CCP was to reduce exposure to air toxics and air-related nuisances throughout the SCAQMD, 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 SCAQMD staff works 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: On October 2, 1992, the SCAQMD Governing Board adopted public notification procedures for Phase I and II facilities. These procedures specify that AB 2588 facilities must provide public notice when exceeding the following risk levels:

- Maximum Individual Cancer Risk: greater than 10 in one million (10×10^6)
- Total Hazard Index: greater than 1.0 for TACs except lead, or greater than 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 AB 2588 Toxics “Hot Spots” Program is implemented through Rule 1402 - Control of Toxic Air Contaminants from Existing Sources. 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 361 facilities in SCAQMD’s AB 2588 program. Since 1992 when the state Health and Safety Code incorporated a risk reduction requirement in the program, SCAQMD has reviewed and approved over 335 HRAs; 50 facilities were required to do a public notice and 24 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 97 percent have acute and chronic hazard indices of less than one. (SCAQMD, 2015a.)

CEQA Intergovernmental Review Program: 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 DPM from truck idling and

movement (e.g., truck stops, warehouse and distribution centers, or transit centers), ship hoteling 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’ Regional 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 (EJ): Environmental justice has long been a focus of SCAQMD. In 1990, SCAQMD formed an Ethnic Community Advisory Group that was restructured as the Environmental Justice Advisory Group (EJAG) in 2008. 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, MATES III, and MATES IV); the Clean Fleet Rules; CIRS; 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 its 2004 Addendum. Key initiatives focusing on communities and residents include the Clean Air Congress; the Clean School Bus Program; Asthma and Air Quality Consortium; Brain and Lung Tumor and Air Pollution Foundation; air quality presentations to schools and community and civic groups; and Town Hall meetings. Technological and scientific projects and programs have been a large part of 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 SCAQMD’s website (www.aqmd.gov).

AB 2766 Subvention Funds: AB 2766 subvention funds, money collected by the state as part of vehicle registration and passed through to SCAQMD, is used to fund projects in local cities that reduce motor vehicle air pollutants. The Clean Fuels Program, funded by a surcharge on motor vehicle registrations in SCAQMD, reduces TAC emissions through co-funding projects that 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 SCAQMD’s Technology Advancement Office help to reduce DPM 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: Senate Bill (SB) 1731, enacted in 1992 and codified in Health and Safety Code Section 44390 et seq., amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan that 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, 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

Multiple Air Toxics Exposure Study (MATES): In 1986, SCAQMD conducted the first MATES report to determine the Basin-wide risks associated with major airborne carcinogens. At the time, the state of technology was such that only 20 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 U.S. EPA, and by CalEPA, including OEHHA and CARB. 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 report to quantify the magnitude of population exposure risk from existing sources of selected air toxic contaminants at that time. 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 DPM 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 part of the SCAQMD Governing Board's 2003-04 Environmental Justice Workplan approved on September 5, 2003. The MATES III report consisted 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 included organic carbon, elemental carbon, and total carbon, as well as, Particulate Matter (PM), including PM2.5. It did not estimate mortality or other health effects from particulate exposures. MATES III revealed a general downward trend in air toxic pollutant concentrations with an estimated Basin-wide lifetime carcinogenic health risk of 1,200 in one million. Mobile sources accounted for 94 percent of the basin-wide lifetime carcinogenic health risk with diesel exhaust particulate contributing to 84 percent of the mobile source Basin-wide lifetime carcinogenic health risk. Non-diesel carcinogenic health risk declined by 50 percent from the MATES II values.

Multiple Air Toxics Exposure Study IV (MATES IV): MATES IV, the current version, includes a monitoring program, an updated emissions inventory of TACs, and a modeling effort to

characterize risk across the Basin. The study focuses on the carcinogenic risk from exposure to air toxics but does not estimate mortality or other health effects from particulate exposures. An additional focus of MATES IV is the inclusion of measurements of ultrafine particle concentrations. MATES IV incorporates the updated health risk assessment methodology from OEHHA. Compared to previous studies of air toxics in the Basin, this study found decreasing air toxics exposure, with the estimated Basin-wide population-weighted risk down by about 57 percent from the analysis done for the MATES III time period. The ambient air toxics data from the ten fixed monitoring locations also demonstrated a similar reduction in air toxic levels and risks. On average, diesel particulate contributes about 68 percent of the total air toxics risk. This is a lower portion of the overall risk compared to the MATES III estimates of about 84 percent.

Health Effects

Carcinogenic Health Risks from TACs: One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of causing cancer. It is currently estimated that about one in four deaths in the United States is attributable to cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods.

Non-Cancer Health Risks from TACs: Unlike carcinogens, for most 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 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).

HAZARDS AND HAZARDOUS MATERIALS

PARs 1146 series and PR 1100 is intended to improve overall air quality; however, it may have direct or indirect hazards associated with the implementation. The reduction of NO_x emissions from PARs 1146 series may affect the use, storage, and transport of hazards and hazardous materials, specifically when SCR technology is being used. New (or modifications to existing) air pollution control equipment and related components are expected to be installed at some of the affected facilities such that their operations may increase the quantity of hazardous materials generated by the control equipment and may increase the quantity of ammonia used. It is anticipated some facilities will need to install SCR technology to meet NO_x emission limits and in doing so, may result in the overall increase in the amount of ammonia injected, increase the amount of ammonia stored, create ammonia slip emissions, and increase the amount of spent catalyst.

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 Basin in large quantities via all modes of transportation including rail, highway, water, air, and pipeline.

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, a number of federal, state, and local laws have been enacted to regulate the use, storage, transportation, and management of hazardous materials and wastes. The most relevant hazardous materials laws and regulations are summarized in the following subsection of this section.

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 SEA, the term "hazardous materials" refers to both hazardous materials and hazardous wastes. A hazardous material is defined as hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local regulatory agency or if it has characteristics defined as hazardous by such an agency. The (H&S) Section 25501(k) defines hazardous material as follows:

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

reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Examples of the types of materials and wastes considered hazardous are hazardous chemicals (e.g., toxic, ignitable, corrosive, and reactive materials), radioactive materials, and medical (infectious) waste. The characteristics of toxicity, ignitability, corrosivity, and reactivity are defined in Title 22, California Code of Regulations (CCR), Section 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.

Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment from pollution into air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

Toxics Substances Control Act: The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as “any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b).” This list included all of chemical substances

manufactured or imported into the United States prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

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 Code of Federal Regulations (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 Safety Data Sheets (SDSs, formerly referred to as material safety data sheets or 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 SDSs exist. Lastly, information about chemical inventories at facilities and SDSs 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 United States Department of Transportation (U.S. DOT) (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding \$50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the U.S. DOT. 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 and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, stricter hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA. California has been delegated authority to operate its own hazardous waste management program.

CERCLA: 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 establishes 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 CAA Amendments of 1990 [42 U.S.C. §7401 et. seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substance. Under these provisions, facilities that produce, process, handle or store hazardous substance have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in Section 112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. At the local level, RMPs are implemented by the local fire departments.

Hazardous Material Worker and Public Safety Requirements

Occupational Safety and Health Administration Regulations: 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.” 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 3-4 summarizes what the codes mean for each hazards category.

In addition to the information in Table 3-4, 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, SDS lists the NFPA 704 flammability hazard ratings (e.g., NFPA 704). NFPA 704 is a standard that provides a readily recognized, easily understood system for identifying flammability hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative flammability hazards of a material.

Table 3-4
NFPA 704 Hazards Rating Code

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

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 represented as a unit less 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 than 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 established by the American Conference of Governmental Industrial Hygiene, OSHA's Permissible Exposure Limits, the Immediately Dangerous to Life and Health levels recommended by the National Institute for Occupational Safety and Health (NIOSH), 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/m³) 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.

State Regulations

Hazardous Materials and Waste Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by 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 California Hazardous Waste Control Law, and the H&S. Under the direction of the CalEPA, the DTSC maintains the Cortese List and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5. The Cortese List consists of the following:

1. Subsection 65962.5. (a)

List provided by DTSC that includes:

- a. All hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code.
- b. All land designated as hazardous waste property or border zone property pursuant to Article 11 (commencing with Section 25220) of Chapter 6.5 of Division 20 of the Health and Safety Code.
- c. All information received by the Department of Toxic Substances Control pursuant to Section 25242 of the Health and Safety Code on hazardous waste disposals on public land.
- d. All sites listed pursuant to Section 25356 of the Health and Safety Code.
- e. All sites included in the Abandoned Site Assessment Program.

2. Subsection 65962.5. (b)

The State Department of Health lists of all public drinking water wells that contain detectable levels of organic contaminants and that are subject to water analysis pursuant to Section 116395 of the Health and Safety Code.

3. Subsection 65962.5. (c)

The State Water Resources Control Board shall list of all of the following:

- a. All underground storage tanks for which an unauthorized release report is filed pursuant to Section 25295 of the Health and Safety Code.
- b. All solid waste disposal facilities from which there is a migration of hazardous waste and for which a California regional water quality control board has notified the Department of Toxic Substances Control pursuant to subdivision (e) of Section 13273 of the Water Code.
- c. All cease and desist orders issued after January 1, 1986, pursuant to Section 13301 of the Water Code, and all cleanup or abatement orders issued after January 1, 1986, pursuant to Section 13304 of the Water Code, that concern the discharge of wastes that are hazardous materials.

4. Subsection 65962.5. (d)

The appropriate local enforcement agency will list of all solid waste disposal facilities from which there is a known migration of hazardous waste.

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 agency responsible for worker safety

in the handling and use of chemicals in the workplace. The CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- H&S §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 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 on-site (not transport) 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. California is proposing modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The proposed regulations were released for public comment on July 15, 2016 and the public comment period closed on September 15, 2016.

Hazardous Materials Disclosure 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: The State of California (H&S Division 20, Chapter 6.95) requires any business that handles 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 H&S and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the state.

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.

Local Regulations

Los Angeles County: The Office of Emergency Management is responsible for organizing and directing the preparedness efforts of the Emergency Management Organization of Los Angeles County. Los Angeles County’s policies towards hazardous materials management include enforcing stringent site investigations for factors related to hazards; limiting the development in high hazard areas, such as floodplains, high fire hazard areas, and seismic hazard zones; facilitating safe transportation, use, and storage of hazardous materials; supporting lead paint abatement; remediating Brownfield sites; encouraging the purchase of homes on the FEMA Repeat Hazard list and designating the land as open space; enforcing restrictions on access to important energy sites; limiting development downslope from aqueducts; promoting safe alternatives to chemical-

based products in households; and prohibiting development in floodways. The county has defined effective emergency response management capabilities to include supporting county emergency providers with reaching their response time goals; promoting the participation and coordination of emergency response management between cities and other counties at all levels of government; coordinating with other county and public agency emergency planning and response activities; and encouraging the development of an early warning system for tsunamis, floods and wildfires.

Orange County: 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 organizations; providing comprehensive, coordinated analysis of hazardous materials issues; and directing the preparation, implementation, and modification of the county’s Hazardous Waste Management Plan (HWMP). Orange County is responsible for its own emergency plans concerning a nuclear power plant accident, and the Incident Response Plan is updated regularly.

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 underground storage tank (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 to deal with these materials.

San Bernardino County: San Bernardino County’s 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.

Emergency Response to Hazardous Materials and Waste Incidents

California Emergency Management Agency: The California Emergency Management Agency (Cal EMA) exists to enhance safety and preparedness in California through strong leadership, collaboration, and meaningful partnerships. The goal of Cal EMA is to protect lives and property by effectively preparing for, preventing, responding to, and recovering from all threats, crimes, hazards, and emergencies. Cal EMA 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, Cal EMA is called upon to provide state and local emergency managers with emergency coordination and technical assistance.

Pursuant to the Emergency Services Act, 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 Emergency Response Plan. The Emergency Response Plan is administered by Cal EMA 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 22 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.

Hazardous Materials Incidents

Hazardous materials move through the region by a variety of modes: 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 and road conditions). According to the Office of Hazardous Materials Safety (OHMS) in the U.S. DOT,

hazardous materials shipments can be regarded as equivalent to deliveries, but any given shipment may involve one or more movements or trip segments, which may occur by different routes (e.g., rail transport with final delivery by truck). According to the Commodity Flow Survey data⁹ there were approximately 2.6 billion tons of hazardous materials shipments in the United States in 2012 (the last year for which data are available). Table 3-5 indicates that trucks move more than 50 percent and pipeline accounts for approximately 24 percent of all hazardous materials shipped from a location in the United States. By contrast, rail accounts for only 4.3 percent of shipments¹⁰.

Table 3-5
Hazardous Material Shipments in the United States in 2012

Mode	Total Commercial Freight (thousand tons)	Hazardous Materials Shipped (thousand tons)	Percent of Total Hazardous Materials Shipped by Mode of Transportation	Percent of Total Commercial Freight Shipped that is Hazardous
Truck	8,060,166	1,531,405	59.4%	19.0%
Rail	1,628,537	110,988	4.3%	6.8%
Water	575,996	283,561	11.0%	49.2%
Pipeline	635,975	626,652	24.3%	98.5%
Other	398,735	27,547	1.1%	6.9%
Total	11,299,409	2,580,153	100.0%	22.8%

Source: U.S. DOT^{11,12}

The movement of hazardous materials through the U.S. transportation system represents about 22.8 percent of total tonnage for all freight shipments as measured by the Commodity Flow Survey. Comparatively, the total commercial freight moved in 2012 in California by all transportation modes was 718,345 thousand tons¹³.

California Hazardous Materials Incident Reporting System: 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 Cal EMA. While information on accidental releases are reported to Cal EMA, Cal EMA no longer conducts statistical evaluations of the releases, e.g., total number of releases per year for the entire State, or data by county. The U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) 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

⁹ USDOT, 2015. United States: 2012; 2012 Economic Census and 2012 Commodity Flow Survey. Issued March 2015. Available at <http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/ec12tcf-us.pdf>

¹⁰ USDOT, 2015. United States: 2012; 2012 Economic Census and 2012 Commodity Flow Survey. Issued March 2015. Available at <http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/ec12tcf-us.pdf>

¹¹ USDOT, 2016. Table 1a. Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2012. Accessed July 25, 2016.

¹² USDOT, 2016a. Table 1a. Shipment Characteristics by Mode of Transportation for the United States: 2012. Accessed July 25, 2016. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/commodity_flow_survey/2012/united_states/table1

¹³ USDOT, 2016b. Table 3: Weight of Outbound Commodity Flows by State of Origin: 2012. Accessed July 25, 2016. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/commodity_flow_survey/2012/state_summaries/tables/table3

date, geographical location (state and county) and type of material released, are available online from the Hazmat Incident Database.

Table 3-6 provides a summary of the reported hazardous material incidents for Los Angeles, Orange, Riverside, and San Bernardino counties for 2012 through 2014 from the Hazmat Incident Database¹⁴. Data presented is for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

Table 3-6
Reported Hazardous Materials Incidents for 2012 - 2014

County	2012	2013	2014
Los Angeles	286	337	287
Orange	270	63	88
Riverside	55	43	50
San Bernardino	261	348	351
Total	872	791	776

In 2012, there were a total of 872 incidents reported for Los Angeles, Orange, Riverside and San Bernardino counties. In 2013, there were a total of 791 incidents reported for Los Angeles, Orange, Riverside and San Bernardino counties, and in 2014 a total of 776 incidents for these four counties. Over the three-year period, San Bernardino and Los Angeles counties accounted for the largest number of incidents, followed by Orange and Riverside counties. As noted in Table 3-6, the number of incidents has reduced over the years.

Hazards Associated with Air Pollution Control

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. Add-on pollution control technologies, such as SCR, have been previously analyzed for hazards. 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 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 systems to less than significant.

Ammonia

Ammonia is the primary hazardous chemical identified with the use SCR technology. 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.

¹⁴ Pipeline and Hazardous Materials Safety Administration (PHMSA), 2015. Incident Reports Database Search. Accessed, November 17, 2015 at <https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx>

Anhydrous ammonia is heavier than air such that when released into the atmosphere, it 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 2016 AQMP control measures that are currently permitted to use anhydrous ammonia, for any new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia. Instead, to minimize the hazards associated with ammonia used in the SCR or SNCR process, aqueous ammonia, 19 percent by volume, is typically required as a permit condition associated with the installation of SCR or SNCR equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and 2) 19 percent aqueous ammonia is not on any acutely hazardous materials lists unlike anhydrous ammonia or aqueous ammonia at higher percentages.

CHAPTER 4

ENVIRONMENTAL IMPACTS

Introduction

Potential Significant Environmental Impacts and Mitigation Measures

Air Quality Impacts

Hazards and Hazardous Materials Impacts

Cumulative Environmental Impacts

Potential Environmental Impacts Found Not to be Significant

Significant Environmental Effects Which Cannot Be Avoided

Significant Irreversible Environmental Changes

Potential Growth-Inducing Impacts

Relationship Between Short-Term and Long-Term Environmental Goals

INTRODUCTION

The CEQA Guidelines require environmental documents to identify significant environmental effects that may result from a proposed project. (CEQA Guidelines Section 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 Section 15126.4.)

The categories of environmental impacts to be studied in a CEQA document are established by CEQA (Public Resources Code Section 21000 *et seq.*), and the CEQA Guidelines, as codified in Title 14 California Code of Regulations Section 15000 *et seq.* Under the CEQA Guidelines, there are approximately 17 environmental categories in which potential adverse impacts from a project are evaluated.

The CEQA Guidelines also indicate that the degree of specificity required in a CEQA document depends on the type of project being proposed. (CEQA Guidelines Section 15146.) The detail of the environmental analysis for certain types of projects cannot be as great as for others. As explained in Chapter 1, the analysis of PARs 1146 series and PR 1100 indicated that the type of CEQA document appropriate for the proposed project is a SEA.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This document is a SEA to the: 1) September 2008 Final EA for Rule 1146; 2) September 2008 Final EA for Rule 1146.1; 3) May 2006 Final EA for Rule 1146.2; and 4) March 2017 Final Program EIR for the 2016 AQMP. The previous environmental analyses in the September 2008 Final EA for Rule 1146.1 and the May 2006 Final EA for Rule 1146.2 contained an environmental checklist and concluded that none of the 17 environmental topic areas would have potentially significant adverse impacts at the time the September 2008 and May 2006 amendments to Rules 1146.1 and 1146.2, respectively, were adopted. However, the previous environmental analysis in the September 2008 Final EA for Rule 1146 concluded that the September 2008 amendments to Rule 1146 would have potentially significant adverse impacts for the environmental topic of air quality and hazards and hazardous materials.

The March 2017 Final Program EIR for the 2016 AQMP determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation. More specifically, the March 2017 Final Program EIR evaluated the impacts from installation and operation of additional control equipment and SCR or SNCR equipment potentially resulting in construction emissions, increased electricity demand, hazards from additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalysts replacements, as well as changes in traffic patterns and volume.

For the entire 2016 AQMP, the analysis concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Since significant adverse environmental impacts were identified, mitigation measures were identified and applied. However, the March 2017 Final Program EIR concluded that the 2016 AQMP would have significant and unavoidable adverse environmental impacts even after mitigation measures were identified and applied. As such, mitigation measures were made a condition of project approval and a Mitigation Monitoring and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was prepared and adopted for this project.

PARs 1146 series and PR 1100 propose to ~~respectively~~ establish BARCT limits ~~and an implementation schedule~~ for reducing NOx emissions at RECLAIM facilities with units subject to Rules 1146, 1146.1, and 1146.2. This will be one of the first set of rules that will help transition RECLAIM facilities to a command-and-control regulatory structure. PR 1100 has been specifically crafted to contains the implementation schedule for Rule 1146 and 1146.1 units to meet the NOx emissions limits. Units at RECLAIM facilities subject to Rule 1146 and 1146.1 will be required to meet the applicable NOx concentration limit for a minimum of 75 percent of the cumulative total heat input by January 1, 2021 and 100 percent by January 1, 2022. For PARs 1146 and 1146.1, similar to the September 2008 amendments to Rules 1146 and 1146.1, compliance is expected to be achieved through the installation of SCR technology or ultra-low NOx burners. ~~Additionally,~~ Permit applications would need to be submitted for units at RECLAIM facilities not currently meeting the applicable NOx concentration limit for units subject to Rules 1146 and 1146.1 before 12 months after the date of rule adoption. Certain units at non-RECLAIM facilities subject to Rules 1146 and 1146.1 would be allowed to defer having to comply with the NOx emission limits until burner replacement or 15 years after the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at 20 ppm must meet the NOx emission limit of 12 ppm by January 1, 2022. Additionally, air pollution control equipment on units subject to Rule 1146 that result in ammonia emissions will be subject to a five ppm ammonia limit and will be required to undergo a source test within 12 months of unit operation after the date of rule adoption and annually thereafter. PARs 1146 series and PR 1100 are expected to result in NOx emission reductions of ~~0.23-0.27~~ ton per day by 2023. The proposed project emission reductions are expected to improve overall air quality in the District and further the progress towards attaining and maintaining state and NAAQS for ozone, PM10, and PM2.5. However, the implementation of the proposed project could create both direct and indirect air quality and hazards and hazardous materials impacts from those sources that install SCR technology or ultra-low NOx burners. The construction of air pollution control equipment, in order to reduce NOx emissions, is expected to exceed the SCAQMD's significance threshold for air quality. Based on the analysis, using EPA RMP*Comp the location of the ammonia storage tanks at some facilities and their vicinity to sensitive receptors could potentially have a significant impact from hazards and hazardous materials. However, after the construction of SCR systems is completed, the operation

of the systems would reduce NO_x emissions; thus, reducing the significant impact to air quality during overlap of construction and operation phases. Nonetheless, the implementation of PARs 1146 series and PR 1100 would be expected to have significant adverse hazards and hazardous materials impacts from the storage and use of ammonia to operate SCR systems. The proposed changes contained in PARs 1146 series are considered to contain new information of substantial importance, which was not known and could not have been known at the time the previous CEQA documents for Rules 1146 and 1146.1 (e.g., the September 2008 Final EAs), Rule 1146.2 (e.g., the May 2006 Final EA), and the 2016 AQMP (e.g., the March 2017 Final Program EIR) were certified. Specifically, the units subject to Rules 1146 and 1146.1 at RECLAIM facilities were not discussed in these previously certified CEQA documents; PARs 1146 series and PR 1100 will create new significant effects to air quality during construction and hazards and hazardous materials that need to be further evaluated in this SEA per CEQA Guidelines Section 15162(a)(3)(A). Thus, only the topics of air quality and hazards and hazardous materials have been analyzed in this SEA.

The environmental impact analysis for this environmental topic area incorporates a “worst-case” approach. This approach entails the premise that whenever the analysis requires that assumptions be made, those 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 air quality and hazards and hazardous materials impacts associated with the implementation of the PARs 1146 series and PR 1100.

AIR QUALITY IMPACTS

Significance Criteria

The environmental analysis assumes that installation of NO_x control technologies (e.g., ultra-low NO_x burners and SCRs) for the affected sources will reduce NO_x 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 of or modification existing NO_x control devices, emissions may be generated by onsite construction equipment and by offsite vehicles used for worker commuting. After construction activities are completed, additional emissions may be generated from the increased electricity use of the SCRs (as GHGs) and offsite vehicles (as criteria pollutants and GHGs) used for delivering fresh materials (e.g., chemicals, fresh catalyst, etc.) needed for operations and hauling away solid waste for disposal or recycling (e.g., spent catalyst). To determine whether air quality impacts from adopting and implementing PARs 1146 series and PR 1100 are significant, impacts will be evaluated and compared to the following criteria. If impacts exceed any of the significance thresholds in Table 4-1, they will be considered significant. All feasible mitigation measures will be identified and implemented to reduce significant impacts to the maximum extent feasible. PARs 1146 series and PR 1100 will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 4-1 are equaled or exceeded. In general, the SCAQMD makes significance determinations for construction and operational impacts based on the maximum or peak daily emissions during the construction or operation period, which provides a “worst-case” analysis of the construction and operational emissions. The type of emission reduction projects that may be

or expected to be undertaken to comply with PARs 1146 series and 1100 are primarily the installation of SCR technology and ultra-low NOx burners on existing boilers, steam generators, and process heaters; thus, this will be analyzed in this SEA.

The physical changes involved with the type of emission control strategies that could be implemented focus on the installation of ultra-low NOx burners and SCR technology at existing stationary combustion sources to reduce NOx emissions. To optimize their equipment overall, facility owners or operators may also employ other burner and flue gas configurations that would be considered to improve the efficiency of the combustion process. However, these optimization activities would not require construction activities, per se, that would involve construction equipment and related emissions. In addition, of the differing control equipment likely to be installed or modified, past projects involving SCR technology installation have been shown to typically generate the greatest amount of construction emissions for an individual project (i.e., potentially significant) and thus, are considered a conservative “worst-case” assumption for the analysis in this SEA. This is especially true when the installation of SCR technology is compared to other control technologies such as ultra-low NOx burners, which have much less environmental impacts when installed and operated. Further, when considering the installation of SCR equipment, SCR systems utilize ammonia which may also require the installation of one or more ammonia storage tanks, depending on each affected facility’s storage availability. Since ammonia is a chronic and acutely hazardous TAC, the installation of ammonia storage tanks must also be considered when evaluating the overall construction and operational activities.

Table 4-1
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds ^a		
Pollutant	Construction ^b	Operation ^c
NO _x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM ₁₀	150 lbs/day	150 lbs/day
PM _{2.5}	55 lbs/day	55 lbs/day
SO _x	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 CO ₂ eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants ^d		
NO ₂ 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)	
PM ₁₀ 24-hour average annual average	10.4 µg/m ³ (construction) ^e & 2.5 µg/m ³ (operation) 1.0 µg/m ³	
PM _{2.5} 24-hour average	10.4 µg/m ³ (construction) ^e & 2.5 µg/m ³ (operation)	
SO ₂ 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99 th 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 $\mu\text{g}/\text{m}^3$ = microgram per cubic meter $\geq$ = greater than or equal to
 MT/yr CO₂eq = metric tons per year of CO₂ equivalents $>$ = greater than

Revision: March 2015

Project-Specific Air Quality Impacts During Construction

Construction-related emissions can be distinguished as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NO_x, SO_x, CO, VOC, PM_{2.5} 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 NO_x control equipment that utilize chemicals as part of the NO_x control equipment operations, such as a new ammonia or 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.

To estimate the “worst-case” construction- and operational-related emissions associated with installing ultra-low NO_x burners or SCRs in order to comply with the NO_x emission limits and transition timing in PARs 1146 series and PR 1100, assumptions were made to estimate combustion emissions from construction emissions onsite, off-site on-road emissions from worker trips and deliveries, on-site fugitive dust emissions, and operational emissions.

The original Draft SEA analyzed the impacts from five facilities operating eight boilers each rated at greater than 75 MMBtu per hour (Group I), and these units are not expected to be able to comply with the NO_x emission limits because they are not currently equipped with NO_x emission control technology. However, after the release of the original Draft SEA for public review and comment, changes were made to the project description after the comment period ended which altered the universe of facilities and the units that may be affected by the proposed project. As an example, in the previous analysis, one facility (previously known as Facility A) had three boilers which have since been decommissioned and have permits that have been inactivated. A subsequent environmental analysis has been conducted based on new information and changes to the project description since the release of the Draft SEA to determine the environmental impacts and is included in this Revised Draft SEA.

Of the RECLAIM facilities that will be affected by PARs 1146 series and PR 1100, there are ~~32~~^{five} facilities operating ~~56~~^{eight} boilers that are each rated greater than ~~20~~⁷⁵ MMBtu per hour (Group I and Group II) and these boilers currently cannot meet the NO_x emission limits of 5 ppm or 7 ppm, respectively, because they are either not equipped with NO_x emission control technology or have older SCR technology that are not capable of meeting the NO_x emission limits. While facilities that do not have NO_x emission control technology may first consider employing ultra-low NO_x burners to achieve the NO_x emission limits for their boilers, steam generators, and process heaters due to the relative ease of installation, operation, control efficiency, and overall cost when compared to SCR technology, retrofitting these larger units with ultra-low NO_x burners alone may not meet the requirement to achieve the final 100 percent compliance with the NO_x emission limits by January 1, 2022. For this reason, the environmental analysis in this SEA assumes that SCR technology or new improved SCR technology for boilers with existing SCR technology, will be installed on the larger units, which is expected to result in the “worst-case”

emissions. Thus, for the ~~32~~^{five} facilities operating ~~56~~^{eight} boilers, ~~eight~~⁵⁶ SCR systems are assumed to be installed (e.g., one SCR for each boiler).

Ammonia or urea is necessary to operate SCR technology, and tanks to store these chemicals would also need to be installed. Since SCR systems utilize ammonia in the NO_x reduction process, as many as one aqueous ammonia storage tank per SCR installation (~~i.e., eight ammonia storage tanks~~) could potentially be installed to support the new SCR systems. Two of the 56 affected units at RECLAIM facilities currently have SCR technology installed with the associated ammonia storage tanks. This analysis assumes that each facility will install one new SCR and one new aqueous ammonia storage tank (e.g., 56 new SCR units plus 56 new ammonia tanks would be installed). However, ~~f~~For any operator installing more than one SCR system at one facility, this analysis assumes that only one large aqueous ammonia storage tank would be installed in lieu of multiple, smaller storage tanks, because it is likely and expected the facilities would want to simplify their delivery schedule. For example, ~~several of the RECLAIM facilities have two or three~~ ^{eight} boilers that are expected to utilize new SCR technology, ~~three boilers are located at one facility~~ so it is possible that the facility operator of ~~these~~^{is} facilities~~y~~ would elect to install one larger aqueous ammonia storage tank, in lieu of two or three smaller tanks, to service the two or three SCR systems~~units~~ to simplify the ammonia delivery schedule. Also by assuming that one larger storage tank would be installed in lieu of multiple smaller storage tanks the impacts of hazards associated with the use and storage of ammonia would represent the “worst-case”. The size of each ammonia tank needed to supply ammonia to each of the ~~56~~^{eight} SCR systems has been estimated to range between 250 and 10,000 gallons in capacity.

Each facility is expected to have sufficient space to install new NO_x control equipment or retrofit existing equipment. However, because installation of larger NO_x air pollution control equipment 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 NO_x control equipment or retrofitting existing 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 equipment such as a crane, forklift et cetera or on-road equipment such as haul trucks, delivery trucks, and passenger vehicles for construction workers. 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. Because the affected equipment are operating at existing facilities, the analysis assumes 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) installing the NO_x control equipment along with supporting devices and structures. Based on previous analyses of an SCR system installation, the typical equipment that may be needed to complete each construction phase at a single affected facility is presented in Table 4-2.

Table 4-2
Construction Equipment That May Be Needed to Install One SCR system at One 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

Construction emissions associated with installing ~~onethe eight~~ SCR systems at ~~onethe five~~ facilities were estimated using the California Emission Estimator Model (CalEEMod), version 2016.3.2. To estimate what the impacts would be for installing one SCR system and associated ammonia storage tank, the following general assumptions were made:

- To provide a “worst-case” analysis, each SCR system and associated ammonia storage tank installation will require its own construction crew and equipment. For any facility with multiple boilers, the installation of SCR systems and associated ammonia storage tanks are assumed to occur in sequential order with the same construction crew and equipment in order to avoid all boilers being offline at the same time.
- The four phases are assumed to occur sequentially during a traditional work week (e.g., five days) and each phase is assumed the following number of days: demolition – five days; site preparation – two days; installation of NOx control equipment – 250 days; and paving – five days.
- During the construction, it is expected for each SCR system for each day of each phase the following number of round-trip trips would occur from the off-road equipment: demolition - 15 trips; site preparation – eight trips; installation of NOx control equipment – 18 trips; and paving – 13 trips. In addition, seven vendor trips are estimated to be needed during the installation of the SCR system~~NOx control equipment~~. It was assumed five hauling trips would occur during the Demolition phase.
- Since each facility will need to meet the applicable NOx concentration limit for a minimum of 75 percent of the cumulative total heat input for all Rules 1146 and 1146.1 units by January 1, 2021, and 100 percent by January 1, 2022, and taking into account the lead time needed to procure contracts, order equipment and obtain SCAQMD permits, construction

is expected to begin in 2019 at the earliest. Further, depending on the facility, construction could last from six months to over one year or more if multiple SCR systems will be installed at one facility. The most SCR systems expected to be installed at one facility is four~~three~~. In order for the facility with four units to meet the compliance deadline, at least three of the four SCR systems would need to be installed at this facility by January 1, 2021.

Table 4-3 presents the peak daily emissions from construction activities to install one SCR at one facility. The implementation of PARs 1146 series and PR 1100 would result in~~Of the 56~~eight~~affected units at 32 facilities and each unit is assumed to need an SCR system installed.~~Eighteen facilities have more than one unit and thus require more than one~~multiple~~SCR systems are assumed to be installed at two facilities. For these 18~~two~~ facilities, however, the installations of SCR systems are assumed to will occur sequentially (e.g., one SCR system at a time) in order to avoid all boilers being offline simultaneously and to maintain operations at each facility. ~~Because~~The proposal provides substantial lead time approximately three years (compliance date of January 1, 2022) in order for facilities to take the necessary actions to achieve compliance, construction of each SCR system at the 32~~five~~affected facilities could~~is not likely to occur on the same day.~~ The construction would likely be staggered amongst the 32~~five~~ affected facilities, because of the lead time needed to procure contracts, order equipment, and obtain SCAQMD permits prior to beginning construction. Thus, the analysis assumes that not all 32 facilities would begin construction on the exact same day and maintain the exact same schedule. However, but it is possible that some overlap of the construction phases would occur. Table 4-3 presents the peak daily emissions for the construction of one SCR system at one facility. Appendix B contains the CalEEMod output files for the annual, summer, and winter construction emissions for the construction of one SCR system at one facility.

Table 4-3
Peak Daily Emissions from Construction Activities of One SCR System at One Facility

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM₁₀ (lb/day)	PM_{2.5} (lb/day)
Installation of 1 SCR	2.30	17.49	23.04	0.03	6.48	3.95
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	NO	NO	NO	NO

~~While unlikely,~~Although it is possible that there could be overlapping construction activities at more than one facility,~~but~~ it is impossible to predict with any accuracy which construction phases would overlap at which facilities. The analysis assumes that five facilities will undergo construction and that these construction activities will overlap. ~~For this reason, the analysis conservatively assumes that five SCR systems would be constructed or have overlapping construction phases occurring on a peak day.~~ At the time of the original Draft SEA was released for public review and comment, five facilities were assumed to install eight SCR systems. Table 4-4 presents the peak daily emissions if construction occurs simultaneously at each of the five affected facilities.

Table 4-4
Peak Daily Emissions from Construction Activities of Five SCR Systems

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM₁₀ (lb/day)	PM_{2.5} (lb/day)
Installation of 5 SCR Systems (Unmitigated)	11.51	87.46	115.22	0.15	32.42	19.77
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	YES	NO	NO	NO

As shown in Table 4-4, the peak daily construction emissions of five SCR systems being installed at five facilities would exceed the SCAQMD's significance threshold for NO_x and thus, result in significant adverse air quality impacts. However, in this Revised Draft SEA, the universe of affected facilities increased and the number of new SCR systems to be installed increased from eight to 56. To adjust for the increased number of affected facilities and corresponding installation of SCR systems, that could potentially have overlapping construction activities, the analysis was adjusted to assume that the construction of 16 SCR systems could potentially occur on the same day.

As shown in Table 4-5, the peak daily construction emissions of 16 SCR systems being installed at 16 facilities would exceed the SCAQMD's significance threshold for NO_x and PM_{2.5}; thus, resulting in significant adverse air quality impacts. However, given the three-year compliance deadline, different phases of construction, length of time to construct a SCR system, and option to replace the boiler instead of construct an SCR system, it is unlikely all 16 units would be constructed on the same peak day.

Table 4-5
Peak Daily Emissions from Construction Activities of 16 SCR Systems

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM₁₀ (lb/day)	PM_{2.5} (lb/day)
Installation of 16 SCR Systems (Unmitigated)	36.80	279.84	368.64	0.48	103.68	63.20
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	YES	NO	NO	YES

In addition to the installation at RECLAIM facilities of SCR systems for boilers, steam generators, or process heaters rated above 2075 MMBtu per hour (Group I and Group II boilers), the proposed project is expected to result in other facilities installing 93244 ultra-low NO_x burners on 93244 boilers, steam generators, or process heaters rated greater than two or less than or equal to 2075 MMBtu per hour (Group III (Rule 1146) and Rule 1146.1) and thermal fluid heaters in order to meet the applicable NO_x emission limit and compliance deadlines. From a construction point of view, the installation of ultra-low NO_x burners on these smaller boilers, steam generators and process heaters (i.e., Group II and Group III units), is a relatively straightforward process, especially when compared to the construction activities and equipment needed to retrofit boilers, steam generators, and process heaters rated above 2075 MMBtu per hour with SCR systems. Specifically, operators of affected facilities who choose to replace existing burners with ultra-low

NOx burners will first need to pre-order and purchase the appropriate size, style and number of burners, shut down the combustion unit to let it cool, and change out the burners. The burner change out may involve a contractor or vendor to remove the bolts, possibly cut and re-weld metal seals and re-fire the burners for equipment start-up. Burner replacements would most likely entail the use of hand tools. Thus, in general, heavy-duty construction activities or equipment are not anticipated for installing ultra-low NOx burners. Once the ultra-low NOx burners are in place, the combustion equipment can be fired up and can operate with lower NOx emissions. Thus, minimal secondary construction impacts are anticipated from the installation of the majority ultra-low NOx burners. To estimate what the impacts would be for installing ultra-low NOx burners, the following assumptions were made:

- 93244 units will be retrofitted with ultra-low NOx burners, with 75 percent occurring by January 1, 2021 and 100 percent completed by the January 1, 2022.
- To meet the 75 percent compliance date (January 1, 2021), approximately 70460 units would need to be retrofitted with ultra-low NOx burners and at least 3580 would be installed during the first year for (e.g., 2019) and the remainder would be installed during the second year (e.g., 2020).
- Since up to six months may be needed to assess the equipment, arrange for a vendor or contractor, and permits application; installation of the ultra-low NOx burners and operation will begin in year 2019.
- Per unit, installation of ultra-low NOx burners will take one day.
- For a “worst-case” analysis, 10 units will have ultra-low NOx burners installed within the same day based on similar analysis conducted from the September 2008 Final EA for Rule 1146.
- One contractor/vendor plus one welder per unit will be needed to retrofit the affected equipment with ultra-low NOx burners.

Table 4-65 summarizes the peak daily construction emissions from retrofitting the affected equipment with ultra-low NOx burners. Appendix B contains the detailed construction estimates and calculations for installing ultra-low NOx burners on the affected equipment.

Table 4-65
Peak Daily Construction Emissions from Retrofitting Equipment
with Ultra-Low NOx Burners

Peak Construction by Year	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
2019						
Total for 1 unit in one day	0.17	1.24	0.46	0.003	0.05	0.01
Peak Daily Total for 10 units installed in one day	1.70	12.42	4.56	0.03	0.55	0.13
~~Peak Total for 80 units installed in one year~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	NO	NO	NO	NO
2020						
Total for 1 unit in one day	0.16	1.15	0.43	0.0003	0.05	0.01
Peak Daily TOTAL for 10 units installed in one day	1.56	11.52	4.25	0.03	0.52	0.13
~~Peak Total for 80 units installed in one year~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	NO	NO	NO	NO
2021						
Total for 1 unit in one day	0.14	1.09	0.40	0.003	0.05	0.01
Peak Daily Total for 10 units installed in one day	1.44	10.85	3.96	0.03	0.49	0.13
~~Peak Total for 51 units installed in one year~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	NO	NO	NO	NO

As shown in Table 4-65, the peak daily construction emissions of retrofitting the equipment with ultra-low NOx burners would not exceed any of the SCAQMD's significance thresholds for one unit on a peak day as well as for 10 units on a peak day for construction years 2019, 2020, and 2021. Of the three construction years, the highest peak daily emissions occur in 2019.

~~Because of the compliance timing in the proposed project, it is unlikely that the e~~Construction of SCR technology will overlap the retrofitting of ~~unit~~equipment with ultra-low NOx burners. Table 4-76 presents a summary of the peak daily construction emissions from the overlapping installations of five SCR systems and ten ultra-low NOx burners.

Table 4-76
Peak Daily Construction Emissions from Overlapping Installations
of SCRs and Ultra-low NOx Burners

Total Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Peak Daily Total for Installation of 5 SCRs (from Table 4-4)	11.51	87.46	115.22	0.15	32.42	19.77
Peak Daily Total for Installation of 10 Ultra-low NOx burners (from Table 4-65)	1.70	12.42	4.56	0.03	0.55	0.13
Total for SCR systems and Ultra-Low NOx Burners	13	100	120	0	33	20
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	YES	NO	NO	NO

*Year 2019 was chosen because it represents the highest emissions of the three construction years.

As shown in Table 4-76, the peak daily construction emissions of concurrently installing five SCR systems being installed at five facilities while also retrofitting 10 units with ultra-low NOx burners would also exceed the SCAQMD's significance threshold for NOx and thus, result in significant adverse air quality impacts during construction.

Rule 1146.2 units

Twenty-nine out of 32 Rule 1146.2 units currently permitted in the RECLAIM program meet the Rule 1146.2 NOx emission limits. ~~Three~~Four of the ~~units~~ 32 units do not meet the NOx emission limits and would require retrofit equipment such as an ultra-low NOx burner or replacement by December 31, 2023 under the proposed rule amendment. The current Rule 1146.2 units at RECLAIM facilities ~~are~~ largely underrepresented. However, RECLAIM facilities with Rule 1146.2 units have until December 31, 2023 to retrofit or replace their equipment. Because the process of retrofitting a boiler with a burner replacement kit on smaller, Rule 1146.2, units is identical to the process of installing ultra-low NOx burners on medium to large units, the construction emissions presented in Table 4-65 can also be attributed to the process of retrofitting a boiler with a burner replacement kit. As shown in Table 4-65, the peak daily construction emissions from retrofitting equipment with ultra-low NOx burners would not exceed any of the SCAQMD's significance thresholds for one unit on a peak day as well as for 10 units on a peak day for construction years 2019, 2020, and 2021. Of the three construction years, the highest peak daily emissions occur in year 2019 and the emissions decrease each subsequent year. Thus, for any burner replacement kits that are installed on Rule 1146.2 units, less than significant air quality impacts would also be expected.

Complete Replacement of Existing Boilers, Heaters, or Steam Generators

In lieu of installing SCR systems or retrofitting existing equipment with ultra-low NOx burners, facility operators may consider completely replacing their existing boilers, heaters, or steam generators for reasons including, but not limited to age, high maintenance and operating costs, fuel efficiency issues, and/or the lack of replacement parts. The proposed project contains a provision that will allow any facility operator that commits to replacing Rules 1146 and 1146.1 equipment with new equipment that can achieve the applicable NOx emission limit(s) to continue to operate

the existing equipment and defer compliance until January 1, 2023. Because of the deferred compliance option, any replacement would not be expected to overlap the construction activities associated with installing SCR systems and ultra-low NOx burners for equipment subject to Rules 1146 and 1146.1.

In addition, certain units at non-RECLAIM facilities may defer compliance with the specified NOx emission limits until the replacement of the unit's burners or 15 years from the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at greater than 20 ppm must meet the NOx emission limit of 12 ppm by January 1, 2022. It is impossible to predict when this would occur for the affected units, because it is a facility-based decision (e.g., cost, long-term planning, etc.) that is dependent on the status of the unit (e.g., unit operation schedule, unit age, and maintenance of the unit, etc.).

Should a complete replacement occur, this analysis assumes that a worse-case would be if a large boiler (rated at greater than 75 MMBtu per hour) is replaced because of its large overall footprint. The following assumptions were made for the replacement of a large boiler:

- Before dismantling can occur, the existing boiler would need to be shut down and allowed to cool. The dismantling and demolition process is estimated to take 20 days and then it would take approximately 3,000 hours or 75 days to install a new boiler, which includes five days of site preparation, 65 days of building construction, and five days of paving.
- Eight workers would be needed to install the new boiler.
- The following equipment would be needed to replace the boiler: one cement/mortar mixer; one concrete/industrial saw; one crane; one rubber tired dozer; one tractor/loader/backhoe; and one welder. They would be used eight hours a day, except for the crane which is expected to be used two hours per day for removing the existing boiler and moving the replacement boiler into place.
- The footprint of the existing boiler is assumed to be 1,000 square feet and the facility operator is assumed to replace the unit with equipment of the same size and footprint.
- Once the new replacement unit becomes operational, the NOx emissions are expected to be fewer than the existing unit and the fuel usage of the new unit will use eight to 10 percent less fuel than the existing unit from improved efficiency.
- No additional employees are expected to be needed to operate and maintain the new unit. The operation and maintenance are expected to be similar for the new unit.

Construction emissions associated with removing one large boiler and replacing it with a new unit of comparable size were estimated using CalEEMod version 2016.3.2. Appendix B contains the detailed construction estimates for a large boiler replacement. Table 4-87 summarizes the peak daily construction emissions from replacing a large boiler with a new unit.

Table 4-87
Peak Daily Construction Emissions from Replacing a Large Boiler

Construction Emissions	VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM₁₀ (lb/day)	PM_{2.5} (lb/day)
Replacement of One Large Boiler	6.33	44.67	58.31	0.07	8.42	5.77
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	NO	NO	NO	NO	NO	NO

As shown in Table 4-87, the construction emissions from the replacement of a large boiler (greater than 75 MMBtu per hour) is less than SCAQMD's significance threshold. Any Rule 1146.2 unit operating at a RECLAIM facility would be required to either meet a NO_x emission limit of 30 ppm if retrofitted with a burner replacement kit or 20 ppm if the unit is replaced. It is difficult to determine which facilities would choose to replace or retrofit a particular unit since there are a variety of factors to be considered. One factor is the useful life of the equipment since an average boiler is estimated to have a useful life of 25 years; however, some units have been known to run effectively for more than 30 years and many have been in operation for over 40 years. Another factor is that a larger unit substantial maintenance for the refractory; thus, a facility operator may opt to replace a unit with a smaller unit that is less maintenance-intensive. Some facility operators may also elect to downsize if replacing an old unit with a new unit because the operations have changed over the years or they are seeking to improve operational efficiency. Further, some facility operators may also determine that it is more cost-effective to retrofit a unit rather than replace it. Overall, the decision as whether to replace a unit with a new unit is dependent upon costs, the ability to retrofit the old unit with ultra-low NO_x burners, equipment age and size, and the facility's operational needs.

Should a facility operator elect to replace a small boiler (e.g., Rule 1146.2 unit at two MMBtu per hour), in lieu of installing a burner retrofit kit, the construction activities would also be expected to result in fewer emissions than the boiler replacement emissions presented in Table 4-87 because the replacement of a smaller unit would require less workers, fewer hours to install, and fewer and smaller heavy-duty equipment. Thus, the construction emissions from replacing a small Rule 1146.2 boiler would also be less than the SCAQMD's significance thresholds.

Construction Mitigation: ~~Except for peak daily NO_x emissions would, no other criteria pollutant emissions exceed the significant thresholds during construction if five or more facilities have overlapping construction occurring on a peak day. However,~~ The proposed project would however result in the overall NO_x emissions reductions of 0.20173 ton per day (405345 pounds per day) by January 1, 2021, or 0.23-0.27 ton per day (540460 pounds per day) by January 1, 2023. Thus, the analysis indicates that there will be an overall reduction in NO_x emissions during construction, because the construction and operational phases will likely overlap. As construction is completed for each SCR system, there will be overall NO_x emission reductions from the operation of each SCR system. The initial construction of one SCR system would result in an increase in emissions; however, the emissions would not be exceed the significance threshold as seen in Table 4-3. The completion and operation of the first SCR system would result in immediate NO_x emission reductions and in effect reduce the peak daily NO_x emissions below the significance threshold. Thus, no significant adverse air quality impacts are expected to remain during the construction phase of the SCR systems.

Remaining Construction Impacts After Mitigation: The air quality analysis concluded that significant adverse air quality impacts could be created by the proposed project because the construction activities will produce emissions that would exceed the SCAQMD's significant threshold for NO_x per day during construction. However, the analysis further indicates that there will be an overall reduction in NO_x emission during both construction and operational phases of the proposed project. Therefore, no significant adverse air quality impacts are expected to remain during the construction of the SCR systems.

Project-Specific Air Quality Impacts During Operation

The proposed project is expected to result in direct air quality benefits from the reduction of ~~0.23~~ 0.27 ton per day of NO_x emissions by January 1, 2023. Implementation is expected to be achieved by installing ultra-low NO_x burners and SCR systems on boilers, steam generators, and process heaters. However, secondary criteria pollutant emissions may 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 for periodic ammonia/urea deliveries for each SCR system installed; 2) vehicle trips via heavy-duty trucks for periodic deliveries of catalyst as well as spent catalyst hauling after the SCR system is installed.

The following assumptions were made about the operation of SCR systems:

- The construction of one ammonia storage tank is assumed to require two one-way truck deliveries of 19 percent aqueous ammonia. Ammonia delivery trucks can deliver approximately 7,000 gallons at any one time.
- Each facility with only one SCR system will have only one ammonia delivery once per month, but the quantity delivered will vary by the size of the storage tank needed. For the facilities that have more than one SCR system that will be installed, it is assumed that the facility will also install one large ammonia storage tank in lieu of multiple smaller storage tanks to save money and space at the facility. ~~(Facility A) that~~ Even with a total of 18 facilities with multiple SCR systems, only one facility would require greater than a 7,000 gallons delivery. At this facility (Facility 6), a 10,000 gallon tank would be required to service all three SCR systems; thus, two ammonia truck deliveries will be needed each month.
- Since the ammonia tanks will be pressurized, no ammonia emissions are expected from filling the storage tanks.
- As a conservative estimate, it is assumed ~~The peak daily trips associated with ammonia/urea deliveries will be one truck per facility-per month for all facilities except Facility 6A which will have two ammonia delivery trucks-per month.~~ The delivery distance of one ammonia truck is assumed to be 100 miles round-trip.
- The initial construction of one SCR unit is assumed to require two one-way truck deliveries of catalyst modules. All initial catalyst deliveries are assumed to occur on the same peak day for all the affected facilities. Catalyst modules are expected to be replaced every two to three years. When spent catalyst removal and replacement becomes necessary, two one-way trucks will be needed to remove the catalyst and two one-way trucks will be needed to deliver the fresh catalyst modules.

- Peak daily trips assume truck trip distances to deliver catalyst would be similar to ammonia and are assumed to be 100 miles round-trip. It is assumed the catalyst delivery vehicles would be similar to the ammonia delivery trucks (heavy-duty).
- No additional employees are anticipated to be needed to operate the new SCR systems because the existing work force per affected facility is expected to be sufficient. As such, no additional emissions from new workers are anticipated from the operation of the new SCR systems.
- ~~Two~~ 60 RECLAIM facilities installing either SCR systems or ultra-low NOx burners are located within ¼-mile of sensitive receptors (e.g., schools, residences, etc.).

A summary of the heavy-duty truck trips from ammonia and catalyst deliveries are presented in Table 4-98.

Table 4-98
Heavy-Duty Truck Trips from Ammonia and Catalyst Deliveries

Heavy-Duty Truck Trips	NH ₃ /Urea Delivery Trips	Catalyst Delivery Trips	Total Trips
Annual	<u>39672</u>	<u>568</u>	<u>45280</u>
Peak Daily	<u>336</u>	<u>325</u>	<u>6541</u>

Secondary operational emissions from the ~~32~~ five facilities were estimated using EMFAC2017 ~~4~~ 17 emission factors and are presented in Table 4-109. Appendix B contains the detailed emissions calculations from the operational activities from the installation of all of the SCR systems.

Table 4-109
Peak Daily Operational Emissions from all the Facilities ~~Five Facilities~~

Operational Activity	CO (lb/day)	NO _x (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	VOC (lb/day)	SOX (lb/day)
Increased Delivery Trucks	<u>1.5519.25</u>	<u>13.8230.43</u>	<u>78.402.18</u>	<u>8.181.22</u>	<u>0.504.54</u>	<u>0.030.12</u>
TOTAL	<u>1.5519.25</u>	<u>13.8230.43</u>	<u>78.402.18</u>	<u>8.181.22</u>	<u>0.504.54</u>	<u>0.030.12</u>
Significance Threshold for Operation	550	55	150	55	55	150
Exceed Significance?	No	No	No	No	No	No

As a conservative estimate, Facility ~~6A~~ was used as the facility that would have the peak daily number of heavy-duty truck trips that would occur at one year at one facility. If the facility receives two ammonia delivery trucks each month and three catalyst deliveries (assuming each SCR system construction was staggered through the year and would require a catalyst delivery each time a SCR system was completed), the peak daily number of heavy-duty truck trips that may occur in one year at one facility (Facility ~~6A~~) is 27. Heavy-duty trucks are prohibited from idling for more than five minutes at any one location as regulated by the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling¹⁵, but they can move to multiple locations and idle at each location for up to five minutes. Thus, as a conservative analysis, this analysis assumes

¹⁵ CARB, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, September 2016.
https://www.arb.ca.gov/msprog/truck-idling/13ccr2485_09022016.pdf

that the trucks may idle for up to a total of 15 minutes per trip. Therefore, a peak of approximately 6.75 hours of idling may occur at one facility in one year. The CARB emission factor for an idling heavy-duty diesel truck is 1.67 grams per hour of diesel particulate matter (DPM). Therefore, a conservative estimate of 0.025 pound of diesel particulate exhaust per year would be generated at a facility. Based on the Tier III methodology described in the SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.0 (March 2016), 0.025 pound of DPM per year would generate a health risk of 0.05 in one million, which is less than the significance threshold of an increased probability of 10 cancer cases in one million. Appendix C contains the Tier III risk assessment calculations.

SCR systems reduce NO_x emissions by using ammonia, which is considered a TAC. Unreacted ammonia emissions generated from these units are referred to as ammonia slip. Ammonia slip is limited to five ppm through permit conditions for new SCR installations. Based on the November 2015 Final Program Environmental Analysis for Proposed Amended Regulation XX - RECLAIM¹⁶ 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 microgram (µg) per cubic meter) and acute (3,200 µg per cubic meter) reference exposure levels (RELs). Table 4-1140 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 4-1140
Health Risk from the Facilities Using Ammonia

Ammonia Slip Concentration at the Exit of the Stack (ppm)	Peak Concentration at a Receptor 25 m from the Stack (µg/m³)	Acute REL (µg/m³)	Chronic REL (µg/m³)	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 SCR systems are installed at one facility, the locations of all the stacks would generally not be situated in the same place within the affected facility's property. For a facility with space limitations and multiple SCR installations, the exhaust would likely be routed to one stack which would still be limited to five ppm ammonia slip. As such, even with multiple SCR system installations, the acute and chronic hazard indices would not be expected to exceed the significance threshold.

¹⁶ SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, November 2015.
<http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf>

PM Impacts from Ammonia Usage

In a SCR system the ammonia is injected into the flue gas stream and reacts with NO_x to form elemental nitrogen (N₂) and water in the cleaned exhaust gas. A small amount of unreacted ammonia (ammonia slip) may pass through. The SCAQMD through permit conditions limits ammonia slip to five ppm. In the November 2015 Final Program EA for NO_x RECLAIM¹⁷, SCAQMD staff conducted a series of regional simulations to determine the impacts of reducing NO_x while increasing the potential for creating ammonia slip due to increased use of ammonia needed for the operation of SCR controls. In the analysis, 14 tons per day of NO_x emission reductions at RECLAIM facilities were estimated while ammonia slip emissions from the same facilities would increase by 1.63 tons per day. The simulations were run for the 2021 draft baseline emissions inventory to estimate what the impacts would be at full implementation of the 14 tons per day decrease in NO_x emissions. The effect of decreasing 14 tons per day of NO_x would result in a decrease of annual PM_{2.5} of approximately 0.7 µg per cubic meter. However, since the usage of ammonia is necessary to achieve the NO_x emission reductions (via SCR technology), the ammonia usage would cause a concurrent increase in annual PM_{2.5} of approximately 0.6 µg per cubic meter. Thus, increasing the amount of ammonia slip would result in a net average 0.1 µg per cubic meter decrease in annual PM_{2.5}. Further, the simulations showed that there would be no change in ozone levels compared to what would occur if there was no increase in ammonia slip. The overall decrease in annual PM_{2.5} would occur provided that all 14 tons per day of NO_x emissions would be reduced, which in turn would reduce PM_{2.5} emissions overall, even if some PM_{2.5} emissions are generated from ammonia slip. In summary, the impacts to regional PM_{2.5} and ozone due to increased ammonia slip in these simulations was concluded to not create a significant adverse impact. Because this proposed project would have substantially less ammonia slip emissions than what was analyzed in the regional simulations. Thus, the impacts to regional PM_{2.5} and ozone due to increased ammonia slip from the proposed project would not create a significant impact.

Odor Impacts

For the installation of new SCR systems, under normal operating and permitted conditions, ammonia slip emissions will be limited to five ppm in accordance with BACT. Because exhaust gases are hot, any ammonia slip emissions from operating a SCR would be quite buoyant and would rapidly rise to higher altitudes without any possibility of lingering at ground level. The odor threshold of ammonia is one to five ppm, but because of the buoyancy of ammonia emissions combined with an average prevailing wind velocity of six miles per hour in the Basin, it is unlikely that ammonia slip emissions would exceed the odor threshold. In addition, during construction, there will be odors associated with the operation of diesel-fueled construction equipment used to install the SCR systems. All diesel-fueled vehicles that may be utilized during operation activities at the facilities will be 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. The use of diesel-fueled trucks as part of operation activities will not be allowed to idle longer than fifteen minutes onsite, so odors would not be expected. Further, because of the relatively small number of pieces of diesel-fueled equipment operating at any one affected site and because construction will only be short-term, odor impacts are not expected to be significant.

¹⁷ SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, November 2015. <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf>

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) (Health and Safety Code Section 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 effects¹⁸.

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 NO_x 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

¹⁸ 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>

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 from CalEEMod for the SCR systems and EMFAC2014 for the ultra-low NO_x burners.

Installation of NO_x 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 NO_x 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 2019. Once the proposed project is fully implemented, the potential NO_x 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 (2019) to the end of the project (January 1, 2022). The beginning of the proposed project was assumed to be no sooner than 2019, since installing NO_x control equipment takes considerable advance planning and engineering. The proposed project is expected to achieve ~~0.23~~ 0.27 ton per day of the NO_x emission reduction, such that any installed or modified NO_x controls could be constructed and operational by December 31, 2023. Thus, once construction is complete and the equipment is operational, CO₂e emissions will remain constant.

Table 4-~~1241~~ summarizes the GHG emissions during the construction of the ultra-low NO_x burners. The peak total for ~~3580~~ units installing ultra-low NO_x burners in one year is approximately five~~42~~ amortized metric tons per year (MT/year). The significance threshold is not exceeded for the construction of ultra-low NO_x burners.

Table 4-1244
GHG Emissions During Construction of Ultra-Low NOx Burners

Peak Construction by Year	CO2 (lbs/day)	CO2 (lbs/yr)	CO2 (MT/yr)
2019			
Total for 1 unit in one day	329.54	n/a	n/a
Peak Daily Total for 10 units installed in one day	3295.39	n/a	n/a
Peak Total for ~~3580~~ units installed in one year	n/a	~~11,533.8526363.08~~	~~5.2311.96~~
Significance Threshold	n/a	n/a	10,000
Exceed Significance?	n/a	n/a	NO

As summarized in Table 4-1342, GHG emissions from the installation of SCR systems and ultra-low NOx burners 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 Plans¹⁹ that was adopted by the SCAQMD Governing Board in December 2008.

Approximately ~~52275~~ amortized²⁰ MT/year of GHGs (as carbon dioxide equivalent emissions or CO2e) from the ~~56~~^{eight} SCR systems and ~~five~~⁴² amortized MT/year from the ultra-low NOx burners would be generated from construction that may occur at the affected facilities in response to implementing the proposed project. Similarly, approximately ~~40~~^{nine} MT/year of GHG emissions would be generated from operation-related activities (e.g., truck trips) that may occur at the facilities in response to implementing the proposed project. In total, ~~56796~~ MT/year of GHG emissions would be generated by construction and operation activities from 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. Table 4-1342 summarizes the GHG emissions from PARs 1146 series and PR 1100.

¹⁹ 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](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf?sfvrsn=2)

²⁰ 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.

Table 4-~~1341~~2
GHG Emissions from the Proposed Project

Activity	CO₂e (MT/year^a)
Construction ^b	<u>52787</u>
Operation	<u>409</u>
Total Project Emissions	<u>56796</u>
Significance Threshold	10,000
Exceed Significance?	No

Note:

- a. 1 metric ton = 2,205 pounds
- b. GHGs from short-term 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. As shown in Tables 4-~~1244~~ and 4-~~1341~~2, the proposed project is expected to generate construction-related CO₂ emissions, and ~~specifically as shown in~~ Table 4-~~1341~~2, the operational phase of the proposed project is also expected to generate additional GHG emissions. When added together, however, the GHGs do not exceed the significance threshold; thus, no adverse significant GHG cumulative impacts are expected from the implementing the proposed project.

HAZARDS AND HAZARDOUS MATERIALS IMPACTS

Significance Criteria

The impacts associated with hazards and hazardous materials 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.

PROJECT-SPECIFIC IMPACTS - HAZARD ANALYSIS:

The hazards and hazardous materials analysis for the proposed project focuses on the transport, storage, and handling of aqueous ammonia used in the SCR system process. To minimize the hazards associated with using aqueous ammonia, it is the 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 materials 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. The only exception to this assumption is the scenario analyzed under the “Ammonia Gas Release” subsection.

Two of the affected facilities are located within 1,000 feet or one-quarter mile of a sensitive receptor, including individuals at hospitals, nursing facilities, daycare centers, schools, and elderly intensive care facilities, as well as residential and off-site occupational areas. Therefore, the 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 as further explained in the following discussion.

The facilities affected by the proposed project are expected to be located within urbanized industrial or commercial/mixed use areas. Some are located within two miles of an airport as noted in Appendix D. Some sites affected by the proposed project may also be identified on lists compiled by the California DTSC per Government Code Section 65962.5. They are also identified in Appendix D. The proposed project is not expected to interfere with existing hazardous waste management programs since facilities handling hazardous waste would be expected to continue to manage any and all hazardous materials and hazardous waste, in accordance with applicable federal, state, and local rules and regulations.

The analysis of hazard impacts can rely on information from past similar projects (i.e., installing new, or retrofitting existing equipment with an SCR system 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 SCR and associated ammonia storage equipment conform to the ammonia hazard analysis in this SEA, no further hazard analysis may be necessary. If site-specific characteristics are involved with future SCR projects that are outside the scope of this analysis, further ammonia hazards analysis may be warranted.

The onsite storage and handling of the ammonia creates the possibility of an accidental spill and release of aqueous ammonia, which could evaporate and present a potential offsite public and sensitive receptor exposure. Since ammonia is not typically considered to be 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. To further evaluate the potential for significant adverse environmental impacts due to an accidental release of aqueous ammonia, various scenarios were evaluated that could occur during the onsite storage, transportation, and transfer of ammonia. These scenarios and their consequences are discussed in detail below.

Hazard Safety Regulations

In spite of implementing modifications to comply with the proposed project, operators of each affected facility must comply or continue to comply with various regulations, including OSHA regulations (29 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, Section 112 (r) of the Federal Clean Air Act Amendments of 1990 [42 USC 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop 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 the changes associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

Because operators of affected facilities are required to comply with all applicable design codes and regulations, conform to National Fire Protection Association standards, and conform to policies and procedures concerning leak detection containment and fire protection, no significant adverse compliance impacts are expected.

Impacts on Water Quality

A spill of any hazardous material such as aqueous ammonia 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 are currently required to have emergency spill containment equipment and would implement spill control measures in the event of an earthquake. Storage tanks typically have secondary containment such as a berm which would be capable of containing 110 percent of the contents of the storage tanks. Therefore, should a rupture occur, the contents of the tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at 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.

Transportation Release

It is expected that the affected facilities utilizing SCR technology 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. The maximum capacity of an ammonia tanker truck is approximately 7,000 gallons. The projections for future ammonia use and storage as calculated relative to the quantity of NO_x emission reductions needed to meet the NO_x emission limits for PARs 1146 series and PR 1100 are shown in Appendix E. The “worst-case” assumption for delivery frequency from a supplier would be to deliver two ammonia tanker trucks on the same day to fill one 10,000-gallon tank of ammonia at a facility (Facility 6A). The “worst-case” for PARs 1146 series and PR 1100 involve a lower number of deliveries of ammonia on any given day (Scenario 1) or a lesser amount of ammonia (Scenario 2) than what is analyzed in the following Transportation Release Scenarios. For both scenarios, the potential impacts from transportation release are expected to be less than significant. Regulations for the transport of hazardous materials by public highway are described in 49 CFR §§ 173 and 177.

Transportation Release Scenario 1:

To evaluate the hazard impacts from an accidental release of ammonia during ammonia transport, this analysis uses as a surrogate the project at the ConocoPhillips Carson Refinery in which SCR system was installed on boiler #10 and an associated 10,000 gallon ammonia storage tank was constructed (Final Negative Declaration for: ConocoPhillips Los Angeles Refinery Carson Plant SCR Unit Project, SCH. No. 2004011066, SCAQMD 2004). This project required approximately six additional ammonia truck transport trips per month. Although truck transport of aqueous ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident that would cause its contents to spill. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, driver training, and weather. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

Every time hazardous materials are moved from the site of generation, opportunities are provided for an accidental (unintentional) release. A study conducted by the EPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in 100 million to one in one million, depending on the type of road and transport vehicle used. The U.S. EPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident involvement rates presented in Table 4-1413. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

In the study completed by the U.S. EPA, cylinders, cans, glass, plastic, fiber boxes, tanks, metal drum/parts, and open metal containers were identified as usual container types. For each container type, the expected fractional release en route was calculated. The study concluded that the release rate for tank trucks is much lower than for any other container type (Los Angeles County, 1988).

Table 4-143
Truck Accident Rates for Cargo on Highways

Highway Type	Accidents Per 1,000,000 miles
Interstate	0.13
U.S. and State Highways	0.45
Urban Roadways	0.73
Composite*	0.28

Source: Environmental Protection Agency, 1984.

*Note: Average number for transport on interstates, highways, and urban roadways.

The accident rates developed based on transportation in California were used to predict the accident rate associated with trucks transporting aqueous ammonia to the facility. Assuming an average truck accident rate of 0.28 accidents per million miles traveled (Los Angeles County, 1988), the estimated accident rate associated with transporting aqueous ammonia for the ConocoPhillips project is 0.00101, or about one accident every 992 years.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated hazardous materials (CCR Title 19, Division 2, Chapter 4.5 or the California Accidental Release Prevention Program requirements), including aqueous ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 7,000 gallons of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent evaporative emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. In a typical release scenario, because of the characteristics of most roadways, the pooling effect on an impervious surface would not typically occur. As a result, the spilled ammonia would not be expected to evaporate into a toxic cloud at concentrations that could significantly adversely affect residences or other sensitive receptors in the area of the spill.

Based on the low probability of an ammonia tanker truck accident with a major release and the potential for exposure to low concentrations, if any, the conclusion of this analysis is that potential impacts due to accidental release of ammonia during this transportation scenario are less than significant.

Transportation Release Scenario 2:

This transportation release scenario uses as a surrogate analysis a project at the BP Carson refinery in which SCR system was retrofitted onto an existing fluid catalytic cracking unit (FCCU) and an associated 12,660 gallon ammonia storage tank was constructed (Final Negative Declaration for: BP Carson Refinery Fluid Catalytic Cracking Unit NO_x Reduction Project: SCH No. 2002021068; SCAQMD, 2002). The following summarizes the ammonia transport analysis for the BP Carson Refinery FCCU project.

The temperature of the ammonia released was estimated as follows. For a delivery truck traveling from a non-desert area and taking into consideration the convective heat transfer from the tanker as it travels at highway speeds, the bulk temperature should be typical of the originating location (July average temperatures for Los Angeles, with no convective heat losses, would typically be 69 degrees Fahrenheit (°F)). To be conservative for purpose of this analysis, the tanker bulk temperature was assumed to be 77 °F.

The proposed project was estimated to require approximately 35 tanker truck deliveries of aqueous ammonia during the first year of operation (two deliveries after construction to fill the tank plus one delivery every 11 days to replenish the tank during operations). Truck accident rates are approximately one in 8.7-million miles (ENSR, 1994). Based upon the projected 35 ammonia deliveries the first year, and a distance of 30 miles from the supplier to the facility, the number of truck-miles associated with the transport of aqueous ammonia is 1,050 truck-miles per year. The expected number of truck accidents associated with the proposed BP Carson project is therefore approximately once every 8,300 years. The likelihood of any release in a transportation accident is 1 in 10, and that of a large release in a transportation accident is 1 in 40 (ENSR, 1994). The likelihood of a major transportation release after the project is constructed is therefore approximately once per 330,000 years (8,300 times 40). The probability of a transportation accident that would pose a significant risk to the public is therefore insignificant.

In the unlikely event that a major release occurred during a tanker truck accident, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. Roads are usually graded and channeled to prevent water accumulation, and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. Therefore, potential impacts due to accidental release of ammonia during this transportation scenario are less than significant.

Ammonia Tank Rupture

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. SCAQMD staff estimated that the largest aqueous ammonia tank that would be installed as a result

of implementing PARs 1146 series would be 10,000 gallons at one facility. The affected facilities were estimated to need anywhere from 250 to ~~10,000~~2,000-gallon tanks. ~~Two~~Twenty-eight facilities- ~~would install a SCR system and thus need an ammonia storage tank~~(Facility A and E) are located within a ¼-mile of sensitive receptors. ~~Of the 32 RECLAIM facilities that would install a SCR system, one facility~~Facility A would require the installation of ~~four~~three SCR systems, ~~four facilities would require the installation of three SCR systems, 13 facilities would require the installation of two SCR systems per facility, and the rest would only install one SCR system per facility.~~ ~~and Facility E would require two SCR systems.~~ It was assumed that these facilities would each store one large aqueous ammonia storage tank to service all of their SCR systems.

Table 4-15
Number of SCR Systems and Affected Facilities

	<u>Number of SCR Systems to be Installed at Each Facility</u>	<u>Number of Affected Facilities</u>
	<u>4</u>	<u>1</u>
	<u>3</u>	<u>4</u>
	<u>2</u>	<u>13</u>
	<u>1</u>	<u>14</u>
<u>Total</u>	<u>56</u>	<u>32</u>

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 CalARP 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 catastrophic 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 the ammonia storage tanks that would be installed in the future, to estimate a worst-case analysis, the following assumptions were made ~~for Facility A and E:~~

- Location of tanks: Within same building as existing boilers; building located at edge of property line, near (i.e., less than ¼-mile) existing residences or sensitive receptors
- ~~Quantity Released of Aqueous Ammonia: 10,000 gallons at Facility A; and 2,000 gallons at Facility E~~
- Liquid Temperature: 77 °F
- Mitigation Measures: None

Appendix E shows the estimated distance to the toxic endpoint for each facility using the estimated tank size needed for enough aqueous ammonia to reduce the facility's emissions to the

NOx limits. :- 1) Facility A is 0.6 miles or 3,168 feet; and 2) Facility E is 0.2 miles or 1,056 feet. Since the Thirteen RECLAIM facilities have sensitive receptors that are located directly across or adjacent to the facilities within the toxic endpoint distance; thus, the hazards and hazardous materials impacts due to tank rupture will be potentially significant. In addition, if mitigation measures (e.g., such as a secondary containment (dikes and/or berms), installation of grating-covered trench around the perimeter, and tertiary containment) an enclosure were to occur, the toxic endpoint distance for both Facilities A and E some facilities would be less than 0.1 miles or 528 feet and the hazards and hazardous materials impacts would continue to be potentially significant due to the vicinity of the sensitive receptors relative to the location of the affected equipment. Therefore, the proposed project has the potential to generate significant adverse hazard impacts as a result of the potential for accidental releases of aqueous ammonia.

If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the impacts of the proposed project.

PROJECT-SPECIFIC IMPACTS – CONCLUSION: Based on the preceding description of hazards and hazardous materials impacts, the proposed project is not expected to generate significant adverse impacts related to the transport of ammonia. However, because the affected facilities (~~Facilities A and E~~) are located within ¼-mile of a sensitive receptor, implementation of the proposed project is expected to generate significant adverse impacts related to the potential for a rupture of an aqueous ammonia storage tank. The overall conclusion is that hazards and hazardous materials impacts for the proposed project are significant.

PROJECT-SPECIFIC MITIGATION MEASURES:

Facilities retrofitting units with SCR systems and the accompanying ammonia storage tank will need to submit permit applications to modify their equipment. Thus, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project to determine if the project is covered by the analysis in this Revised Draft SEA. 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 Section 15126.4). Therefore, feasible mitigation measures to reduce the risk of an offsite consequence to nearby sensitive receptors are necessary.

The following mitigation measures are required for any facility whose operators choose to install a new aqueous ammonia storage tank and the offsite consequence analysis indicates that sensitive receptors will be located within the toxic endpoint distance. In addition, these mitigation measures will be included in a mitigation monitoring and reporting plan as part of issuing SCAQMD permits to construct for the facility-specific project. These mitigation measures will be enforceable by SCAQMD personnel.

HZ-1 Require the use of aqueous ammonia at concentrations less than 20 percent by volume.

HZ-2 Install safety devices, including but not limited to: continuous tank level monitors (e.g., high and low level), temperature and pressure monitors, leak monitoring and detection system, alarms, check valves, and emergency block valves.

HZ-3 Install secondary containment such as dikes and/or berms to capture 110 percent of the storage tank volume in the event of a spill.

HZ-4 Install a grating-covered trench around the perimeter of the delivery bay to passively contain potential spills from the tanker truck during the transfer of aqueous ammonia from the delivery truck to the storage tank.

HZ-5 Equip the truck loading/unloading area with an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to the extent that no hazards impact is possible in the event of an accidental release during transfer of aqueous ammonia.

HZ-6 Install tertiary containment that is capable of evacuating 110 percent of the storage tank volume from the secondary containment area.

Implementing Mitigation Measures HZ-1 through HZ-6 would be expected to prevent a catastrophic release of ammonia from leaving the facility property and exposing offsite sensitive receptors; however, as an abundance of caution, due to the anticipated number of affected facilities and without detailed information specific to each facility's layout and plan of action for compliance, the overall conclusion is that hazards and hazardous materials impacts for the proposed project are significant.

~~The following mitigation measures are recommended.~~

~~It is SCAQMD policy to require the use of 19 percent aqueous ammonia instead of a higher aqueous ammonia concentration or anhydrous ammonia to reduce adverse impacts from SCR units.~~

~~Install secondary containment (e.g., berms), valves that fail shut, emergency release valves and barriers around the aqueous ammonia storage tanks. These design measures can be used to prevent physical damage to storage tanks or limit the release of aqueous ammonia storage tanks. These techniques are also typically required by local fire departments.~~

~~Conduct integrity testing of aqueous ammonia storage tanks to assist in preventing failure from structural problems.~~

~~Build a containment system to be used during off-loading operations.~~

REMAINING IMPACTS: Although the aforementioned mitigation measures, if employed, would reduce the hazards and hazardous materials impacts from aqueous ammonia, they are not expected to reduce impacts to less than significant. Therefore, the remaining hazardous and hazardous materials impacts from exposure to the ERPG 2 level of 0.14 mg/l of aqueous ammonia due to tank rupture are considered to be significant after mitigation.

CUMULATIVE IMPACTS: As noted in previous discussions, the accidental release of aqueous ammonia during transport is not expected to result in exposures to ammonia exceeding the ERPG 2 level. However, because the sensitive receptors are closer than 0.1 mile to Facilities A and E for several facilities, an accidental release of ammonia onsite, either during unloading from a truck or an accidental release in the event of storage tank failure is considered significant. Mitigation measures were identified, but it was concluded that they could not reduce hazard impacts from project-specific releases of ammonia to less than significant.

Adverse impacts from an accidental release of aqueous ammonia are localized impacts (i.e., the impacts are isolated to the area around the affected facility). ~~There are two~~None of the affected

facilities that have been identified as potentially are installing SCR systems and ammonia storage tanks in accordance with the proposed project are located within one mile of each other. The worst-case aqueous ammonia toxic endpoint is less than or equal to 0.1 mile, ~~for Facilities A and E.~~ Since ~~two~~none of the facilities that would install SCR system(s) are within one mile of each other, ~~some~~no receptors ~~would~~ be affected by accidents at multiple facilities depending on the location of the accident. However, to the extent that affected facilities are located near other facilities that have hazardous materials risks, the cumulative adverse hazard impacts from this project could contribute to existing nearby hazard risks from other projects. Therefore, cumulative hazard risks from implementing the proposed project are considered to be significant.

CUMULATIVE IMPACT MITIGATION: Because the project-specific hazards and hazardous materials impacts are considered to be cumulatively considerable for ammonia storage, cumulative mitigation measures for hazards and hazardous materials impacts for ammonia storage are required. However, since no mitigation measures have been identified over and above the extensive safety regulations that currently apply to the storage of ammonia, no feasible cumulative mitigation measures for ammonia storage have been identified that would reduce cumulative impacts from hazards and hazardous materials to less than significant. Therefore, cumulative hazards and hazardous materials impacts remain significant; however, because no additional mitigation measures were identified no cumulative mitigation measures for hazards and hazardous materials impacts for ammonia use and storage are required.

CUMULATIVE ENVIRONMENTAL IMPACTS

CEQA Guidelines Section 15130(a) requires a discussion of cumulative impacts if a project may have an effect that is potentially cumulatively considerable, as defined in CEQA Guidelines Section 15065(a)(3). The preceding analysis concluded the cumulative secondary impacts associated with the NO_x emissions limits and compliance dates as contained in PARs 1146 series and PR 1100 will have the potential for creating significant adverse air quality impacts during construction for NO_x, because the SCAQMD's significance threshold for NO_x will be exceeded (see Tables 4-4 and 4-7~~6~~). It should be noted, however, that even though the NO_x emissions during construction have been shown to exceed the significance threshold, because the proposed project reduces NO_x emissions at greater levels than the increases during construction, the net effect of the proposed project will result in overall emission reductions of NO_x. In addition, the construction impacts will be temporary (for approximately one year and the overall NO_x emissions will be reduced during the construction and operation overlap. To achieve NO_x emission reductions in the proposed project, SCR systems would need to be constructed and ultra-low NO_x burners would need to be installed. Further, because of the proposed project's overall NO_x emission reductions, the temporary emission increases in NO_x during construction will not interfere with the air quality progress and attainment demonstration projected in the 2016 AQMP. Based on regional modeling analyses performed for the 2016 AQMP, implementing control measures contained in the 2016 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. In particular, the federal annual PM_{2.5} standards are predicted to be achieved in 2023 with implementation of the proposed ozone strategy and the California annual PM_{2.5} standard will be achieved in 2025. The 2016 AQMP is also expected to achieve the ozone 8-hour standard by 2023.

Per CEQA Guidelines Section 15130(e), previously approved land use documents, including, but not limited to, general plans, specific plans, regional transportation plans, plans for the reduction

of greenhouse gas emissions, and local coastal plans may be used in a cumulative impact analysis. A pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference pursuant to the provisions for tiering and program EIRs. No further cumulative impacts analysis is required when a project is consistent with a general, specific, master, or comparable programmatic plan where the lead agency determines that the regional or areawide cumulative impacts of the proposed project have already been adequately addressed, as defined in CEQA Guidelines Section 15152(f), in a certified EIR for that plan. Further, if a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in CEQA Guidelines Section 15183(j).

As a result, even if the proposed project would have significant increases in NO_x emissions during construction, full implementation of the proposed project would achieve NO_x emission reductions capable of offsetting the construction NO_x emissions. Also, implementation of other control measures in the 2016 AQMP will provide human health benefits by reducing population exposures to existing NO_x emissions. Therefore, cumulative 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 2016 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 2016 AQMP Final Program EIR that cumulative air quality impacts from all AQMP control measures are not expected to be significant²¹. Therefore, there will be no significant cumulative adverse operational air quality impacts from implementing the proposed project.

In addition, there is a potential for creating significant adverse hazards and hazardous materials impacts from the catastrophic failure of an ammonia storage tank, which has been based on the toxic endpoint (using EPA RMP*Comp) and the proximity of Facilities A and E to nearby sensitive receptors. 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 Section 15064 (h)(1) and therefore, generate significant adverse cumulative hazards and hazardous materials impacts. However, for ammonia use and storage, 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 Section 15064 (h)(1) and therefore, do not generate significant adverse cumulative hazards and hazardous materials impacts.

POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

Because this SEA is a subsequent CEQA document to the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP, this SEA relies on the conclusions reached in these documents as evidence for environmental areas where impacts were found not to be significant. All of these previous CEQA documents reviewed approximately 17 environmental topic areas and analyzed whether the

²¹ SCAQMD, Final Program Environmental Impact Report for the 2016 Air Quality Management Plan, March 2017; see Attachment D, Chapter 5, pp. 5-7 to 5-9. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-mar3-035.pdf>.

respective projects would create potentially significant adverse impacts. While the analyses in the September 2008 Final EA for 1146.1 and May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic area, the analysis in the September 2008 Final EA for Rule 1146 identified two environmental topic areas as having significant adverse environmental impacts: 1) air quality; and 2) hazards and hazardous materials.

Also, the analysis in the March 2017 Final Program EIR for the 2016 AQMP concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. It is important to note, however, that for these environmental topic areas, not all of the conclusions of significance are applicable to this currently proposed project, PARs 1146 series and PR 1100. Table 4-1614 summarizes the eight significant and unavoidable adverse environmental impacts identified in the March 2017 Final Program EIR and identifies which apply to the proposed project, PARs 1146 series and PR 1100.

Table 4-1614

Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project

Conclusion of Significant Impacts in March 2017 Final Program EIR	Applicable to/Significant for the Proposed Project?	Explanation
Aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships	No	Neither catenary lines nor the use of bonnet technology for ships are applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR technology). Therefore, this conclusion is not applicable to the proposed project.
Construction air quality and GHGs	Yes	This conclusion is applicable to the proposed project. The impacts for these environmental topics areas are analyzed in this SEA (see pp. 4-3 to 4-13 for construction air quality and pp. 4-17 to 4-20 for GHGs).
Energy due to increased electricity demand	No	While the use of SCR technology for eight boilers will require some electricity to operate, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1 have demonstrated that the amount of electricity that would be needed to operate SCR technology would be less than significant. Similarly, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1, and the March 2006 Final EA for Rule 1146.2 have also demonstrated that the amount of electricity that would be needed to replace burners with ultra-low NOx burners would also be less than significant.

Table 4-1614 (continued)
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project

Conclusion of Significant Impacts in March 2017 Final Program EIR	Applicable to/Significant for the Proposed Project?	Explanation
Hazards and hazardous materials due the increased flammability of solvents	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR technology) do not utilize solvents for their operation. Therefore, this conclusion is not applicable to the proposed project.
Hazards and hazardous materials due to the storage, accidental release and transportation of ammonia	Yes	This conclusion is applicable to the proposed project because SCR technology utilizes ammonia. The impacts for this environmental topic area are analyzed in this SEA (see pp. 4-21 to 4-28)
Hazards and hazardous materials due to the storage and transportation of LNG	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCRs) do not utilize LNG for their operation. Therefore, this conclusion is not applicable to the proposed project.
Hazards and hazardous materials due to proximity to schools	Yes	This conclusion is applicable to the proposed project because some of the affected facilities that will install SCR technology or ultra-low NOx burners are near schools. The impacts for this environmental topic area are analyzed in this SEA (see pp. 4-21 to 4-28)
Hydrology (water demand)	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR technology) do not utilize water for their operation. Therefore, this conclusion is not applicable to the proposed project.
Construction noise and vibration	No	While the construction activities associated with installing SCR technology for eight boilers may create some noise and vibration, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1 have demonstrated that the amount of electricity that would be needed to operate SCRs would be less than significant. Similarly, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1, and the March 2006 Final EA for Rule 1146.2 have also demonstrated that the construction noise and vibration that may occur while replacing burners with ultra-low NOx burners would also be less than significant.
Solid construction waste and operational waste from vehicle and equipment scrapping	No	Vehicle scrapping is not applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR technology). Therefore, this conclusion is not applicable to the proposed project.

Table 4-1614 (concluded)
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project

Conclusion of Significant Impacts in March 2017 Final Program EIR	Applicable to/Significant for the Proposed Project?	Explanation
Transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors	No	Catenary lines and the associated transportation and traffic impacts on roadways and at the harbors are applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR technology). Therefore, this conclusion is not applicable to the proposed project.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined that will be substantially more severe than what was discussed in the September 2008 Final EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)). Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

By preparing a SEA for the proposed project, since the topics of air quality and hazards and hazardous materials are the only environmental topic areas that would be affected by PARs 1146 series and PR 1100, no other environmental topic areas have been evaluated in this SEA. Thus, the conclusions reached in this Revised Draft SEA are consistent with the conclusions reached in the previously certified CEQA documents (e.g., the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP) that aside from the topics air quality during construction and hazards and hazardous materials, there would be no other significant adverse effects from the implementation of the proposed project. Thus, the proposed project would have no significant or less than significant direct or indirect adverse effects on the following environmental topic areas:

- aesthetics
- air quality during operation
- agriculture and forestry resources
- biological resources
- cultural resources
- energy
- geology and soils
- hydrology and water quality
- land use and planning

- mineral resources
- noise
- population and housing
- public services
- recreation
- solid and hazardous waste
- transportation and traffic

The September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP can be found using the links referenced in Chapter 2.

SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

CEQA Guidelines Section 15126(b) requires an environmental analysis to consider "any significant environmental effects which cannot be avoided if the proposed project is implemented." This SEA identified the topics of air quality during construction and hazards and hazardous materials as the environmental topic areas having potentially significant adverse environmental affects if the proposed project is implemented.

SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines Section 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 SEA identified the topic of air quality during construction and hazards and hazardous materials as the environmental areas with potentially significant adverse impacts if the proposed project is implemented. The significant adverse air quality impacts during construction will be mostly offset by the overall operational NOx emission reductions. As a result, even though the proposed project would have significant air quality impacts during construction, the proposed project overall will achieve substantial NOx emission reductions to offset the construction emissions and will provide human health benefits as a result. Implementation of other control measures in the 2016 AQMP will also provide human health benefits by reducing population exposures to existing NOx emissions. For these aforementioned reasons, the proposed project would not result in irreversible environmental changes or irretrievable commitment of resources for the topic of air quality.

Significant adverse impacts to hazards and hazardous materials from the storage and use of ammonia cannot be mitigated to less than significant levels; thus, they may be considered irreversible because facility operators that install new SCRs for reducing NOx emissions are likely to operate these systems for the lifetime of the equipment.

POTENTIAL GROWTH-INDUCING IMPACTS

CEQA Guidelines Section 15126(d) requires an environmental analysis to consider the "growth-inducing impact of the proposed action." 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.

RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM ENVIRONMENTAL GOALS

CEQA documents are required to explain and make findings about the relationship between short-term uses and long-term productivity. (CEQA Guidelines Section 15065(a)(2).) 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. PARs 1146 series and PR 1100 will begin transitioning units at RECLAIM facilities subject to Rules 1146, 1146.1, and 1146.2 to a command-and-control regulatory structure. The primary objective of this project is to ensure all Rules 1146 and 1146.1 units meet NO_x emission limits and BARCT level equivalency. PR 1100 will provide the implementation schedule for PAR 1146 and 1146.1 and eventually include other future rules for equipment exiting RECLAIM. PARs 1146 series and PR 1100 implement control measure CMB-05 from the 2016 AQMP. NO_x, is a precursor to the formation of ozone and PM_{2.5}, so even if the proposed project is implemented and there will be some NO_x emissions during construction and operation, there will also be an overall NO_x emissions reduction occurring in 2022 and these will continue to 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 during construction and to hazards and hazardous materials for ammonia storage are concluded to have potentially significant adverse effects.

CHAPTER 5

ALTERNATIVES

Introduction

Methodology for Developing Project Alternatives

Description of Alternatives

Comparison of Alternatives

Alternatives Rejected as Infeasible

Lowest Toxic Alternative

Environmentally Superior Alternative

Conclusion

INTRODUCTION

[This Revised Draft SEA provides a discussion of alternatives to the proposed project as required by CEQA. Alternatives include measures for attaining objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. A 'no project' alternative must also be evaluated. The range of alternatives must be sufficient to permit a reasoned choice, but need not include every conceivable project alternative. CEQA Guidelines Section 15126.6(c) specifically notes that the range of alternatives required in a CEQA document is governed by a 'rule of reason' and only necessitates that the CEQA document set forth those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision making and meaningful 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 SEA than is required for an EIR under CEQA.

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 NO_x emission limits and the timing of compliance. Of the amendments proposed to Rules 1146, 1146.1, and 1146.2, only the components that pertain to complying with the NO_x 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, four 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 and timing in which compliance with the NO_x emission factors may be achieved.

Typically for projects with potentially significant adverse environmental impacts, the existing setting is established at the time the Notice of Preparation/Initial Study (NOP/IS) is circulated for public review. However, this SEA is a subsequent to multiple CEQA documents that were certified at different times and not all of the previous CEQA documents were concluded to have potentially significant adverse impacts. As previously explained, the proposed project is a revision to the previously approved projects that were analyzed in the September 2008 Final EAs for Rules 1146 and 1146.1, May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP.

The September 2008 Final EA for Rule 1146 concluded that significant adverse air quality and hazards and hazardous materials impacts would occur. However, all other environmental topic areas analyzed in the September 2008 Final EA for Rule 1146 were shown to have less than significant or no significant impacts. Both the September 2008 Final EA for Rule 1146.1 and the May 2006 Final EA for Rule 1146.2 concluded that no significant adverse environmental impacts would occur not from the respective projects. The March 2017 Final Program EIR for the 2016

AQMP determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste and transportation.

CEQA Guidelines Section 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.” Chapter 3 summarizes the existing setting/baseline for control measure CMB-05 from the 2016 AQMP as well as the current version of Rules 1146, 1146.1, and 1146.2.

DESCRIPTION OF ALTERNATIVES

The analysis of the proposed project determined that, of the amendments proposed, only the components that pertain to the implementation of SCR systems to meet certain NO_x emission limits could have potential significant adverse air quality impacts during construction. The analysis also identified potential significant adverse hazards and hazardous materials impacts for ammonia storage and use. In particular, two of the affected facilities were shown to reach the toxic endpoint distance for aqueous ammonia from a catastrophic failure of a storage tank that would significantly adversely affect the sensitive receptors within 0.1 mile of the existing equipment. As such, alternatives were developed by identifying and modifying major components of the proposed project. The rationale for selecting and modifying specific components of the proposed project to generate feasible alternatives for the analysis is based on CEQA's requirement to present "realistic" alternatives; that is, alternatives that can actually be implemented.

Five alternatives to the proposed project have been developed and summarized in Table 5-1, as follows: Alternative A - No Project, Alternative B - Compliance Deadline Extension, Alternative C - 100% of Units by January 1, 2021, Alternative D - All Ultra-Low NO_x Burners, and Alternative E — NO_x RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits Lowering Limit for ≥ 40 and < 75 MMBtu/hr. The primary components of the proposed alternatives that have been modified are the source categories that may be affected, and the manner and timing in which compliance with the NO_x 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 Governing Board may choose to adopt any portion or all of any alternative presented in the Final SEA with appropriate findings as required by CEQA. The Governing Board is able to adopt any portion or all of any of the alternatives presented because the impacts of each alternative will be fully disclosed to the public and the public will have the opportunity to comment on the alternatives and impacts generated by each alternative. Written suggestions on potential project alternatives received during the comment period for the Revised Draft SEA will be considered when preparing the Final SEA and will be included as an appendix of the Final SEA.

The following subsections provide a brief description of the alternatives.

Proposed Project (NO_x Emission Limits and Compliance Deadlines):

PARs 1146 series and PR 1100 will begin transitioning units at RECLAIM facilities subject to Rules 1146, 1146.1, and 1146.2 to a command-and-control regulatory structure. The primary objective of the proposed project is to ensure all ~~RECLAIM~~ facilities with Rules

1146 and 1146.1 units meet NO_x emission limits and BARCT level equivalency. PARs 1146 series would: 1) expand the applicability to include units at NO_x RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NO_x concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NO_x emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on units with applicable air pollution control equipment and require annual ammonia source testing; and 6) require certain units at non-RECLAIM facilities to meet new NO_x emission limits according to the compliance schedules specified in Rules 1146 and 1146.1. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. . 1) expand the applicability to include units that were not previously required to comply with Rules 1146/1146.1 because they were in the NO_x RECLAIM program; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NO_x concentration limits in Rules 1146/1146.1; 3) require the affected equipment to meet the applicable NO_x concentration limit for all Rule 1146/1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146/1146.1 units to notify the Executive Officer which unit(s) will be replaced; and 5) require RECLAIM facilities with Rule 1146.2 units to meet the rule's NO_x emission limits by December 31, 2023 if a more stringent BARCT limit is not applicable. PR 1100 will provide the implementation schedule for PARs 1146 series and eventually include other future rules for equipment exiting RECLAIM. PARs 1146 series and PR 1100 implement control measure CMB-05 from the 2016 Final AQMP.

Alternative A: No Project (Current Rule)

Alternative A, the no project alternative, means that the current version of Rules 1146, 1146.1, and 1146.2 that were amended in November 2013, and April 2006, respectively, would remain in effect and there would be no transitioning out of the NO_x RECLAIM program. Under the current version of Rules 1146 and 1146.1, units at RECLAIM facilities would not have to comply with the NO_x emission limits in Tables 1146-1 and 1146.1-1, respectively. Under this alternative, no NO_x emission reductions will be achieved and the units subject to Rules 1146 and 1146.1 at RECLAIM facilities would not meet BARCT level equivalency. However, the December 2015 amendments to the NO_x RECLAIM program evaluated BARCT level equivalency for combustion units that would have otherwise that would have been subject to Rules 1146, 1146.1, and 1146.2 had they not been in the RECLAIM program. Furthermore, the environmental impacts for the December 2015 amendments were evaluated in the Final Program EA that was certified in December 2015²². Under this alternative, units subject to Rules 1146, 1146.1, and 1146.2 at RECLAIM facilities would not begin the transition to a command-and-control regulatory structure. In addition, under this alternative the implementation schedule in PR 1100 would also not take effect.

²² SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, November 2015. <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeapplusappendices.pdf>

Alternative B: Compliance Deadline Extension

Under Alternative B, the requirements would be equivalent to the proposed project, but the compliance deadline for meeting the NO_x emissions limits would be shortened by one year for 25 percent of units. At a facility, 75 percent of the units subject to Rules 1146 and 1146.1 would need to meet the applicable NO_x emission limit by January 1, 2022 and 100 percent would need to achieve compliance by January 1, 2023. In addition, the facilities would have one additional year to submit permit applications. The extension of the compliance deadline for units subject to Rules 1146 and 1146.1 is less stringent than the proposed project.

Alternative C: 100% of Units by January 1, 2021

Under Alternative C, the NO_x emission limits would remain the same as the proposed project, but facilities would need to meet 100 percent compliance one year earlier than the proposed project, by January 1, 2021. The earlier compliance date would apply to 25 percent of the units subject to Rules 1146 and 1146.1. The earlier compliance date under Alternative C is more stringent than the proposed project.

Alternative D: All Ultra-Low NO_x Burners

Under Alternative D, the NO_x emission limit would be less stringent for Group I (Rule 1146) units than the proposed project, but it would have the same compliance deadline as the proposed project. Under Alternative D, the Group I units would need to meet a NO_x emission limit of nine ppm (or 0.011 pound per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu). The Group II and III units (Rule 1146) and fire-tube boilers rated between two and five MMBtu (Rule 1146.1) units would need to meet nine ppm (or 0.011 pound per MMBtu) instead of the proposed five ppm or seven ppm (or 0.00085 pound per MMBtu). The NO_x emission limit for thermal fluid heaters would also remain at 30 ppm (or 0.037 pound per MMBtu) instead of 12 ppm (0.015 pound per MMBtu). Thus, the thermal fluid heaters would not meet BARCT NO_x emissions equivalency. All other requirements in the proposed project would remain the same for Alternative D. Overall, Alternative D would be less stringent than the proposed project.

Alternative E: NO_x RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
Lowering Limit for ≥ 40 and < 75 MMBtu per hour

Under Alternative E, only NO_x RECLAIM facilities would be affected. The NO_x emission limit would be less stringent than the proposed project for the following units with: a rated heat input of greater than or equal to 420 and less than 75 MMBtu per hour (Group II); a rated heat input of greater than or equal to two but less than 20 MMBtu per hour (Rules 1146 and 1146.1) for fire-tube boilers; and thermal fluid heaters. Alternative E would require include a subset of Group II units and Group III units to meet nine ppm (or 0.011 pounds per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu) for Group II units with an existing NO_x limit greater than 12 ppm and seven ppm (or 0.0085 pound per MMBtu) for Group II units with an existing NO_x limit less than 12 ppm and Group III fire-tube boilers that would be subject to the five ppm NO_x emission limits as Group I units.

In addition, under Alternative E, any units with a rated heat input greater than two but less than five MMBtu per hour would need to meet nine ppm. In the proposed project, units with a rated heat input greater than two but less than five MMBtu per hour are required to meet seven ppm for fire-tube boilers and water-tube boilers would need to meet nine ppm. In addition, under Alternative E, thermal fluid heaters would remain at the current NOx emission limit of 30 ppm (or 0.037 pound per MMBtu). All other requirements in the proposed project would remain the same for Alternative E. Overall, Alternative E would be ~~less~~more stringent than the proposed project.

Table 5-1
Summary of the Proposed Project and Alternatives

<u>Rule No.</u>	<u>Group No.</u>	<u>Heat Input or Equipment Type</u>	<u>Fuel Type</u>	<u>Proposed Project</u>	<u>Alternative A: No Project</u>	<u>Alternative B: Compliance Deadline Extension</u>	<u>Alternative C: 100% of units by January 1, 2021</u>
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 *If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm			
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm			
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm			
1146	I	≥ 75 MMBtu/hr	Natural Gas	5 ppm or 0.0062 lb/MMBtu			
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NOx limit >12 ppm	Gaseous Fuel (excluding Landfill or Digester Gas)	5 ppm or 0.0062 lb/MMBtu			
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NOx limit <12 ppm	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	III	≥ 5 and < 20 MMBtu/hr (Fire-tube boilers only)	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	III	≥ 5 and < 20 MMBtu/hr (Excluding Fire-tube boilers)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu			
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu			
1146	-	Low Fuel Usage (< 90,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier			
1146	-	≥ 5 MMBtu/hr Thermal Fluid Heaters	Natural Gas	12 ppm or 0.015 lb/MMBtu			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm			
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu			

***Note: Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factor Tables 1 and 3 and are shown in Table 1-3.

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NO _x RECLAIM facilities transitioning to command and control regulatory structure)		Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of units by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023	See Rule 2002 Emission Factor, Table 1 and 3*	75% of units by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm				
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm				
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm				
1146	I	≥ 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Natural Gas	5 ppm or 0.0062 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu				
1146	III	≥ 5 and < 20 MMBtu/hr (excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)	Gaseous Fuel (excluding Landfill or Digester Gas)					
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)	Natural Gas	9 ppm or 0.011 lb/MMBtu				
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later				
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023	-	No Change	No Change	
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule	-	Compliance deadline would be extended by one year	Compliance deadline would be shortened by one year for 25% of units	

*Note: Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factor Tables 1 and 3 and are shown in Table 1-3.

Table 5-1:
Summary of the Proposed Project and Alternatives (continued ~~Concluded~~)

<u>Rule No.</u>	<u>Group No.</u>	<u>Heat Input or Equipment Type</u>	<u>Fuel Type</u>	<u>Proposed Project</u>		<u>Alternative A: No Project</u>	<u>Alternative B: Compliance Deadline Extension</u>	<u>Alternative C: 100% of units by January 1, 2021</u>
<u>1146.1</u>	=	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters)</u>	<u>Natural Gas</u>	<u>9 ppm or 0.011 lb/MMBtu</u>	<u>75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023</u> <u>*If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)</u>	<u>See Rule 2002 Emission Factor, Table 1 and 3**</u>	<u>75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023</u>	<u>100% of units by January 1, 2021</u>
<u>1146.1</u>	=	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers)</u>	<u>Natural Gas</u>	<u>7 ppm or 0.0085 lb/MMBtu</u>				
<u>1146.1</u>	=	<u>> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015 lb/MMBtu</u>				
<u>1146.1</u>	=	<u>Low Fuel Usage (≤ 18,000 therms/year)</u>	<u>Any Fuel</u>	<u>12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit’s burners are replaced, whichever is earlier</u>				
<u>1146.2</u>	=	<u>≤ 2 MMBtu/hr</u>	<u>Natural Gas</u>	<u>30 ppm, unless a more stringent limit is applicable, by December 31, 2023</u>		=	<u>No Change</u>	<u>No Change</u>
<u>1100</u>	=	<u>Rule 1146 and 1146.1 Units only</u>	=	<u>Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule</u>		=	<u>Compliance deadline would be extended by one year</u>	<u>Compliance deadline would be shortened by one year for 25% of units</u>

**Table 5-1:
Summary of the Proposed Project and Alternatives (continued)**

<u>Rule No.</u>	<u>Group No.</u>	<u>Heat Input or Equipment Type</u>	<u>Fuel Type</u>	<u>Proposed Project</u>		<u>Alternative D: All Ultra-Low NOx Burners</u>	<u>Alternative E: NOx RECLAIM Facilities Transitioning to Command-and- Control Regulatory Structure at Current Limits</u>
<u>1146</u>	-	<u>≥ 5 MMBtu/hr</u>	<u>Gaseous Fuel (excluding Landfill or Digester Gas)</u>	<u>30 ppm or 0.036 lb/MMBtu</u>	<u>75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 *If the unit is located at a non- RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)</u>	<u>No Change</u>	<u>No Change</u>
<u>1146</u>	-	<u>≥ 5 MMBtu/hr</u>	<u>Non-Gaseous Fuels</u>	<u>40 ppm</u>		<u>No Change</u>	<u>No Change</u>
<u>1146</u>	-	<u>≥ 5 MMBtu/hr</u>	<u>Landfill Gas</u>	<u>25 ppm</u>		<u>No Change</u>	<u>No Change</u>
<u>1146</u>	-	<u>≥ 5 MMBtu/hr</u>	<u>Digester Gas</u>	<u>15 ppm</u>		<u>No Change</u>	<u>No Change</u>
<u>1146</u>	I	<u>≥ 75 MMBtu/hr</u>	<u>Natural Gas</u>	<u>5 ppm or 0.0062 lb/MMBtu</u>		<u>9 ppm or 0.011 lb/MMBtu</u>	<u>No Change</u>
<u>1146</u>	II	<u>≥ 20 and < 75 MMBtu/hr with an existing NOx limit >12 ppm</u>	<u>Gaseous Fuel (excluding Landfill or Digester Gas)</u>	<u>5 ppm or 0.0062 lb/MMBtu</u>		<u>9 ppm or 0.011 lb/MMBtu</u>	<u>9 ppm or 0.011 lb/MMBtu</u>
<u>1146</u>	II	<u>≥ 20 and < 75 MMBtu/hr with an existing NOx limit <12 ppm</u>	<u>Gaseous Fuel (excluding Landfill or Digester Gas)</u>	<u>7 ppm or 0.0085 lb/MMBtu</u>			
<u>1146</u>	III	<u>≥ 5 and < 20 MMBtu/hr (Fire-tube boilers only)</u>	<u>Gaseous Fuel (excluding Landfill or Digester Gas)</u>	<u>7 ppm or 0.0085 lb/MMBtu</u>			
<u>1146</u>	III	<u>Atmospheric Unit (≤ 10 MMBtu/hr)</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015 lb/MMBtu</u>		<u>No Change</u>	<u>No Change</u>
<u>1146</u>	-	<u>Low Fuel Usage (≤ 90,000 therms/year)</u>	<u>Any Fuel</u>	<u>12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier</u>		<u>No Change</u>	<u>No Change</u>
<u>1146</u>	-	<u>≥ 5 MMBtu/hr Thermal Fluid Heaters</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015 lb/MMBtu</u>		<u>30 ppm or 0.037 lb/MMBtu</u>	<u>30 ppm or 0.037 lb/MMBtu</u>
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u>	<u>Gaseous Fuel (excluding Landfill or Digester Gas)</u>	<u>30 ppm or 0.037 lb/MMBtu</u>		<u>No Change</u>	<u>No Change</u>
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u>	<u>Landfill Gas</u>	<u>25 ppm</u>		<u>No Change</u>	<u>No Change</u>
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u>	<u>Digester Gas</u>	<u>15 ppm</u>		<u>No Change</u>	<u>No Change</u>

**Table 1-2:
Summary of the Proposed Project and Alternatives (concluded)**

<u>Rule No.</u>	<u>Group No.</u>	<u>Heat Input or Equipment Type</u>	<u>Fuel Type</u>	<u>Proposed Project</u>		<u>Alternative D:</u> <u>All Ultra-Low</u> <u>NOx Burners</u>	<u>Alternative E:</u> <u>NOx RECLAIM Facilities</u> <u>Transitioning to Command-</u> <u>and-Control Regulatory</u> <u>Structure at Current Limits</u>
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u> <u>(Atmospheric Units)</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015</u> <u>lb/MMBtu</u>	<u>75% of the</u> <u>cumulative total</u> <u>heat input capacity</u> <u>of all Rules 1146</u> <u>and 1146.1 units at</u> <u>the facility by</u> <u>January 1, 2021 and</u> <u>100% by January 1,</u> <u>2022, unless unit</u> <u>replacement by</u> <u>January 1, 2023</u> <u>*If the unit is</u> <u>located at a non-</u> <u>RECLAIM facility</u> <u>compliance can be</u> <u>deferred until</u> <u>burner replacement</u> <u>or within 15 years</u> <u>of the date of rule</u> <u>adoption, whichever</u> <u>is earlier, unless the</u> <u>unit is a thermal</u> <u>fluid heater</u> <u>currently permitted</u> <u>at >20 ppm (these</u> <u>units must meet 12</u> <u>ppm by January 1,</u> <u>2022)</u>	<u>No Change</u>	<u>No Change</u>
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u> <u>(excluding Fire-tube boilers,</u> <u>Atmospheric Units and Thermal</u> <u>Fluid Heaters, but including at</u> <u>Schools/Universities)</u>	<u>Natural Gas</u>	<u>9 ppm or 0.011 lb/MMBtu</u>		<u>No Change</u>	<u>9 ppm or 0.011</u> <u>lb/MMBtu</u> <u>No Change</u>
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u> <u>(Any Fire-Tube Boilers)</u>	<u>Natural Gas</u>	<u>7 ppm or 0.0085</u> <u>lb/MMBtu</u>		<u>9 ppm or 0.011</u> <u>lb/MMBtu</u>	
<u>1146.1</u>	-	<u>> 2 MMBtu/hr and < 5 MMBtu/hr</u> <u>(Thermal Fluid Heaters)</u>	<u>Natural Gas</u>	<u>12 ppm or 0.015</u> <u>lb/MMBtu</u>		<u>30 ppm or 0.037</u> <u>lb/MMBtu</u>	<u>30 ppm or 0.037 lb/MMBtu</u>
<u>1146.1</u>	-	<u>Low Fuel Usage</u> <u>(≤ 18,000 therms/year)</u>	<u>Any Fuel</u>	<u>12 ppm, 15 years after the</u> <u>date of rule adoption or</u> <u>when 50 percent or more</u> <u>of the unit’s burners are</u> <u>replaced, whichever is</u> <u>earlier30 ppm by January</u> <u>1, 2022 or burner</u> <u>replacement, whichever</u> <u>occurs later</u>		<u>No Change</u>	<u>No Change</u>
<u>1146.2</u>	-	<u>≤ 2 MMBtu/hr</u>	<u>Natural Gas</u>	<u>30 ppm, unless a more stringent limit is</u> <u>applicable, by December 31, 2023</u>		<u>No Change</u>	<u>No Change</u>
<u>1100</u>	-	<u>Rule 1146 and 1146.1 Units only</u>	-	<u>Permit application submittal by 12 months within</u> <u>date of rule adoption and compliance with</u> <u>implementation schedule</u>		<u>No Change</u>	<u>No Change</u>

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NOx RECLAIM facilities transitioning to command and control regulatory structure)		Alternative D: All Ultra-Low NOx Burners	Alternative E: Lowering Limit for ≥ 40 and < 75 MMBtu/hr
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of units by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023	No Change	No Change
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146	I	≥ 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Natural Gas	5 ppm or 0.0062 lb/MMBtu		9 ppm or 0.011 lb/MMBtu; 75% of units by January 1, 2021 and 100% by January 1, 2022	No Change
1146	II	≥ 20 and < 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu		No Change	5 ppm for units > 40 MMBtu/hr
1146	III	≥ 5 and < 20 MMBtu/hr (excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)	Gaseous Fuel (excluding Landfill or Digester Gas)			No Change	No Change
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)	Natural Gas	9 ppm or 0.011 lb/MMBtu		No Change	No Change
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later		No Change	No Change
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		No Change	No Change

COMPARISON OF ALTERNATIVES

The following sections describe the potentially significant adverse air quality and hazards and hazardous materials impacts that may occur for each project alternative. Potentially significant adverse operational air quality impacts are quantified where sufficient data are available. A comparison of the environmental impacts for each project alternative is provided in Table 5-2. No other environmental topics other than air quality during construction and hazards and hazardous materials were determined to be significantly adversely affected by implementing any project alternative.

Pursuant to the requirements in CEQA Guidelines Section 15126.6(b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potential impacts to air quality and hazards and hazardous materials from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 5-2. Secondary impacts from the proposed project were identified as having significant adverse impacts for air quality from the construction of the SCR systems and for hazards and hazardous materials from storage of ammonia (accidental rupture). The proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to construction activities and the storage of ammonia (accidental rupture) while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Pursuant to CEQA Guidelines Section 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 5-2 provides a matrix displaying the major characteristics and significant environmental effects of the proposed project and each alternative.

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives

<u>Category</u>	<u>Proposed Project</u>	<u>Alternative A: No Project</u>	<u>Alternative B: Compliance Deadline Extension</u>	<u>Alternative C: 100% of Units by January 1, 2021</u>	<u>Alternative D: All Ultra-Low NOx Burners</u>	<u>Alternative E: NOx RECLAIM Facilities Transitioning to Command-and- Control Regulatory Structure at Current Limits</u>
<u>Air Quality</u>	Expected to result in NOx emission reductions of 0.27 ton per day by January 1, 2023. Affected RECLAIM facilities will transition to a command-and-control regulatory structure. Certain non-RECLAIM facilities will meet NOx emission limits during replacement or within 15 years of the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at >20 ppm must meet 12 ppm by January 1, 2022. All units will meet BARCT NOx emissions equivalency from the implementation of command-and control regulatory structure.	No new NOx emission reductions will be achieved. RECLAIM facilities would not transition to a command-and control regulatory structure and all (including some non-RECLAIM) units would not meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project except the reductions would be delayed by one year. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all (including some non-RECLAIM) units will meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project, but emissions would be achieved sooner (by January 1, 2021). Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units (including some non-RECLAIM) will meet BARCT level equivalency.	Expected to result in lesser NOx emission reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure. Some facilities would not meet BARCT level equivalency.	Expected to result in less NOx emissions reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and control regulatory structure, but units would not reach BARCT level equivalency.
<u>Significance of Air Quality Impacts</u>	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems.	Not Significant: This would not result in an exceedance of SCAQMD's regional air quality CEQA significance threshold for NOx. The SCAQMD will not achieve any emissions reductions; thus, attainment for the SCAQMD for ozone is unlikely to occur.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but with a delay in the operational benefit.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but achieves the operational benefits sooner.	Not Significant: This would result in an amount that is less significant than the proposed project and would not exceed SCAQMD's regional air quality CEQA significance threshold for NOx.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems to meet the NOx emission limits. The impacts are at an amount that is less significant than the proposed project and NOx emissions reductions would be less than the proposed project.

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (Concluded)

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra-Low NOx Burners	Alternative E: NOx RECLAIM Facilities Transitioning to Command-and- Control Regulatory Structure at Current Limits
<u>Significance of Hazards and Hazardous Materials Impacts</u>	Significant: To operate, SCR systems require ammonia. Ammonia is considered a hazardous material. At 32 facilities, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors would result in significant impacts.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. The number of affected facilities would be the same as the proposed project. The level of significance in this alternative is equivalent to the amount in the proposed project.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. The number of affected facilities would be the same as the proposed project. The level of significance in this alternative is equivalent to the amount in the proposed project.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. All facilities with affected units would need to retrofit with ultra-low NOx burners; thus, no hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Less stringent NOx emission limits would result in fewer affected facilities constructing SCR systems; thus, a fewer number of ammonia storage tanks would be needed. However, depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance and thus still result in significant impacts, but at an equivalent amount of the proposed project. It is estimated four facilities would be affected from this alternative.

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra Low NOx Burners	Alternative E: Lowering Limit for ≥ 40 and < 75 MMBtu/hr
Air Quality	Expected to result in NOx emission reductions of 0.23 ton per day by January 1, 2023. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units will meet BARCT level equivalency.	No new NOx emission reductions will be achieved. RECLAIM facilities would not transition to a command-and-control regulatory structure and all units would not meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project except the reductions would be delayed by one year. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units will meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project, but emissions would be achieved sooner (by January 1, 2021). Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units will meet BARCT level equivalency.	Expected to result in lesser NOx emission reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure. Some facilities would not meet BARCT level equivalency.	Expected to result in more NOx emissions reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure and units will be equal to or more stringent than BARCT.
Significance of Air Quality Impacts	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems.	Not Significant: This would not result in an exceedance of SCAQMD's regional air quality CEQA significance threshold for NOx. The SCAQMD will not achieve any emissions reductions; thus, attainment for the SCAQMD for ozone is unlikely to occur.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but with a delay in the operational benefit.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but achieves the operational benefits sooner.	Not Significant: This would result in an amount that is less significant than the proposed project and would not exceed SCAQMD's regional air quality CEQA significance threshold for NOx.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx. Due to the construction of additional SCR systems to meet the NOx emission limits, the impacts are at an amount that is more significant than the proposed project but with more operational benefits.
Significance of Hazards and Hazardous Materials Impacts	Significant: To operate, SCR systems require ammonia. Ammonia is considered a hazardous material. At two facilities, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors would result in significant impacts.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint. The significance in this alternative is equivalent to the amount in the proposed project.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint. The significance in this alternative is equivalent to the amount in the proposed project.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint. Additional facilities would be subject to the lower NOx emission limit. As a result, the construction of more SCR systems and ammonia storage tanks would occur. The significance is greater than the amount in the proposed project.

ALTERNATIVES REJECTED AS INFEASIBLE

In accordance with CEQA Guidelines Section 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. CEQA Guidelines 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 the Introduction, 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 discussion identifies Alternative A, the No Project Alternative, as being rejected due its failure to meet most of the basic project objectives.

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 2016 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. More importantly, a No Project alternative in the case of the proposed project is not a legally viable alternative because it violates a state law requirement in Health and Safety Code Section 40440 that regulations mandate the use of BARCT for existing sources and for the subset of RECLAIM facilities subject to the requirements of ABs 617 and 398.

“The ‘no project’ analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, *as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services...*” It should be noted that, except for air quality, there would be no further incremental impacts on the existing environment if no further action is taken. Although there are other existing rules that may have future compliance dates for NO_x emission reductions, potential adverse impacts from these rules have already been evaluated in the Final Program EIR for the 2016 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 PM_{2.5} standard may be achieved; however, it is unlikely that further progress would be made towards achieving the state PM_{2.5} standard as required by the California CAA.

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 the hazards and hazardous materials discussion in Chapter 4, 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 (e.g., SCRs) are expected to be installed at affected facilities such that their operations may increase the quantity of ammonia (a hazardous material) used in the control equipment. The main NOx reduction technologies considered for the proposed project are based on employing SCRs and ultra-low NOx burners. The analysis shows that of the possible NOx controls, only the use of SCRs may increase the use of toxic materials (e.g., aqueous ammonia).

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. For the proposed project, ultra-low NOx burners are the least toxic technology when compared to SCRs. Of the five alternatives, only Alternative A – the No Project alternative and Alternative D – All Ultra-Low NOx Burners, do not assume that SCRs and ammonia will be utilized. Thus, hazardous materials would not be needed if either of these alternatives are implemented.

Under Alternative A, the No Project alternative, no NOx emission limits would be imposed on Rules 1146/1146.1/1146.2 units and no NOx control equipment (e.g., SCRs or ultra-low NOx burners) would be installed. Further, no significant adverse impacts from construction and operating NOx control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative A, 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 A is implemented. While Alternative A results in no toxic emissions when compared to the proposed project, it is not the environmentally superior alternative because it results in no NOx benefits and does not meet the project objectives.

Under Alternative D, no SCRs would be installed and only ultra-low NOx burners would be installed. Further, no significant adverse impacts from construction and operating NOx control equipment would be expected to occur. Since no SCRs would be installed under Alternative D, no hazards and hazardous materials impacts would be expected. Thus, from a hazard and air toxics perspective, when compared to the proposed project and the other alternatives under consideration, if implemented, Alternative D is considered to be the lowest toxic alternative.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Pursuant to CEQA Guidelines Section 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.

If Alternative A is implemented, PARs 1146 series and PR 1100 would not be adopted; thus, the proposed project’s objectives would not be achieved and no NOx emissions reductions would occur such that the corresponding health benefits that result from NOx emission reductions would also not occur. If Alternative A is implemented, the baseline of NOx emissions currently generated by the affected units will remain unchanged. Currently, the Basin is in non-attainment for ozone and cannot achieve attainment unless NOx emissions reductions occur. In addition, implementing Alternative A means that RECLAIM facilities with units subject to Rules 1146, 1146.1, and 1146.2 would not transition to a command-and-control regulatory structure or some units would not achieve BARCT level equivalency. Units at non-RECLAIM facilities would also not meet BARCT level equivalency. Alternative A would result in no significant air quality or hazards and hazardous materials impacts; however, this alternative would not achieve the project objectives.

If Alternative B is implemented, the compliance deadline would be extended by one year. The same NOx emissions reductions would be achieved as the proposed project; however, the NOx emission reductions would be achieved one year later (e.g., a delay in the operational benefits). If Alternative B is implemented the air quality impacts during construction would occur up to one year later depending when facility operators decide to install SCR systems on their affected equipment. Once the SCR systems are installed and operational, the hazards and hazardous materials impacts would be the same. Like the proposed project, Alternative B is implemented, the project objectives would be achieved and equivalent significant adverse environmental impacts for the topics of air quality during construction and hazards and hazardous materials due to ammonia storage and use during operation would occur.

If Alternative C is implemented, the desired NOx emissions reductions would be achieved sooner (100 percent by January 1, 2021) than the proposed project. The earlier compliance date would apply to 25 percent of the units subject to Rules 1146 and 1146.1. For this reason, Alternative C provides equivalent NOx emission reductions on an expedited schedule when compared to the proposed project which will in turn allow for the corresponding benefits to air quality and public health to occur earlier. Of the significant adverse impacts from air quality during construction and hazards and hazardous materials that would be generated under Alternative C, the impacts would be greater than the proposed project, because of the compressed schedule; however, the project objectives would be achieved.

If Alternative D is implemented, all units subject to Rules 1146 and 1146.1 would be required to install ultra-low NOx burners to meet NOx emission limits of nine ppm (or 0.011 pound per MMBtu) by the same compliance date as the proposed project (75 percent of units by January 1, 2021 and 100 percent of units by January 1, 2022). Alternative D would result in fewer NOx emissions reductions than the proposed project without achieving BARCT NOx emissions equivalency. Thus, Alternative D would result in reduced benefits to public health and air quality and would not achieve all of the project objectives. If Alternative D is implemented, no SCR systems would be installed and no ammonia would be needed such that there would be less than significant air quality impacts during construction and the significant adverse hazards and hazardous materials impacts due to ammonia use would also be eliminated. For these reasons,

Alternative D is considered to be the environmentally superior alternative. However, the project's objectives would not be achieved.

If Alternative E is implemented, units with a rated heat input of greater than or equal to 7540 MMBtu per hour would be required to meet a five ppm NOx emission limit. Alternative E would require Group II and Group III units to meet nine ppm (or 0.011 pounds per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu) for Group II units with an existing NOx limit greater than 12 ppm and seven ppm (or 0.0085 pound per MMBtu) for Group II units with an existing NOx limit less than 12 ppm and Group III fire-tube boilers. Under Alternative E, any units with a rated heat input greater than two but less than five MMBtu per hour would need to meet nine ppm. In the proposed project, units with a rated heat input greater than two but less than five MMBtu per hour are required to meet seven ppm for fire-tube boilers and water-tube boilers would need to meet nine ppm. In addition, under Alternative E, thermal fluid heaters would remain at the current NOx emission limit of 30 ppm (or 0.037 pound per MMBtu). Under Alternative E, the affected units will have the same compliance deadline as the proposed project (e.g., 75 percent of units by January 1, 2021 and 100 percent compliance by January 1, 2022). To achieve a five ppm NOx emission limit, the subset of Group II units (with a rated heat input of greater than or equal to 40 MMBtu, but less than 75 MMBtu) would need to have SCR systems. Because less SCR systems would be need to be installed to meet NOx emissions limits, Alternative E is less stringent than the proposed project. However, the installation of additional SCR systems would result in significant adverse impacts to air quality during construction and hazards and hazardous materials for ammonia. If Alternative E is implemented, the air quality impacts are expected to be less greater on a peak day than the proposed project, because of the installation of additional SCR systems. The impacts from the hazards and hazardous materials for ammonia may be equivalent or less greater than the proposed project depending on the location and size of the ammonia storage tanks required by the construction of the additional SCR system and the proximity to sensitive receptors. Because less more units would have SCR systems installed and in turn would result in less allow for greater NOx emission reductions than would otherwise occur if the same units only had the burners replaced with ultra-low NOx burners under the proposed project, Alternative E would be less more stringent than the proposed project. Alternative E would not also achieve all of the project objectives and still while creating significant adverse impacts to air quality during construction than the proposed project and possibly for hazards and hazardous materials for ammonia storage and use.

In summary, of the five alternatives, Alternative D would be considered the environmentally superior alternative.

CONCLUSION

Of the five alternatives analyzed, Alternative A would generate the least severe and fewest number of environmental impacts compared to the proposed project. However, of the project alternatives, Alternative A would achieve the fewest of the project objectives and would have the fewest NOx reduction benefits.

Thus, from a hazard and air toxics perspective, when compared to the other alternatives under consideration, if implemented, Alternative D is considered to be the lowest toxic alternative and the environmentally superior alternative. However, Alternative D does not achieve the same NOx reductions that would result if the proposed project is implemented.

Thus, when comparing the environmental effects of the project alternatives with the proposed project and evaluating the effectiveness of achieving the project objectives of the proposed project versus the project alternatives, the proposed project provides the best balance in achieving the project objectives while minimizing the significant adverse environmental impacts to air quality during construction and hazards and hazardous materials.

APPENDICES

Appendix A: PARs 1146 series and PR 1100

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APPENDIX A

PARs 1146 SERIES AND PR 1100

APPENDIX A-1

Proposed Amended Rule 1146

(Adopted September 9, 1988)(Amended January 6, 1989)
(Amended May 13, 1994)(Amended June 16, 2000)
(Amended November 17, 2000)(Amended September 5, 2008)
(Amended November 1, 2013)(PAR September 18, 2018)

**RULE 1146 EMISSIONS OF OXIDES OF NITROGEN FROM
INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL
BOILERS, STEAM GENERATORS, AND PROCESS
HEATERS**

(a) Applicability

This rule applies to boilers, steam generators, and process heaters of equal to or greater than 5 million Btu per hour rated heat input capacity used in all industrial, institutional, and commercial operations, ~~with the exception of:~~

- ~~(1) — boilers used by electric utilities to generate electricity; and~~
- ~~(2) — boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; and~~
- ~~(3) — sulfur plant reaction boilers.~~
- ~~(4) — RECLAIM facilities (NO_x emissions only)~~

(b) Definitions

- (1) ADSORPTION CHILLER UNIT means any natural gas fired unit that captures and uses waste heat to provide cold water for air conditioning and other process requirements.
- (2) ANNUAL CAPACITY FACTOR means the ratio of the amount of fuel burned by a unit in a calendar year to the amount of fuel it could have burned if it had operated at the rated heat input capacity for 100 percent of the time during the calendar year.
- (3) ANNUAL HEAT INPUT means the ~~actual amount of heat released by fuels burned in~~ total heat input to a unit during a calendar year.
- (4) ATMOSPHERIC UNIT means any natural gas fired unit with a heat input less than or equal to 10 million Btu per hour with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.
- (5) BOILER or STEAM GENERATOR means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel and used to produce steam or to heat water and that is not used exclusively to produce electricity for sale. Boiler or Steam Generator does not include any open heated tank, adsorption chiller unit, or waste heat

recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment.

- (6) BTU means British thermal unit or units.
- (7) COMMERCIAL OPERATION means any office building, lodging place, or similar location designed for tenancy by one or more business entities or residential occupants.
- (8) FIRE-TUBE BOILER means any BOILER that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam.
- (9) FORMER RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.
- (810) GROUP I UNIT means any unit burning natural gas with a rated heat input greater than or equal to 75 million Btu per hour, excluding thermal fluid heaters and units operated at schools and universities.
- (911) GROUP II UNIT means any unit burning gaseous fuels, excluding digester and landfill gases, with a rated heat input less than 75 million Btu per hour down to and including 20 million Btu per hour, excluding thermal fluid heaters and units operated at schools and universities.
- (4012) GROUP III UNIT means any unit burning gaseous fuels, excluding digester and landfill gases, ~~and thermal fluid heaters~~ with a rated heat input less than 20 million Btu per hour down to and including 5 million Btu per hour, and all units operated at schools and universities greater than or equal to 5 million Btu per hour, excluding atmospheric units and thermal fluid heaters.
- (4413) HEALTH FACILITY has the same meaning as defined in Section 1250 of the California Health and Safety Code.
- (4214) HEAT INPUT means the chemical heat released due to ~~fuel-complete~~ combustion of an amount of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.
- (4315) INDUSTRIAL OPERATION means any entity engaged in the production and/or provision of chemicals, foods, textiles, fabricated metal products, real estate, personal services or other kindred or allied products or services.

- (1416) INSTITUTIONAL OPERATION means any public or private establishment constituted to provide medical, educational, governmental, or other similar services to promote safety, order, and welfare.
- (17) MODIFICATION means any physical change that meets the criteria set forth in Rule 1302 – Definitions.
- (18) NON-RECLAIM FACILITY means a facility that is was not in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.
- (14519) NOx EMISSIONS means the sum of nitric oxides and nitrogen dioxides ~~in the flue gas emitted, collectively expressed~~calculated as nitrogen dioxide.
- (14620) OPEN HEATED TANK means a non-pressurized self-heated tank that may include a cover or doors that can be opened or detached to put in or remove parts, components or other material for processing in the tank. Tanks heated solely by an electric heater, boiler, thermal fluid heater or heat recovered from another process using heat exchangers are excluded from this definition.
- (14721) PROCESS HEATER means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven 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.
- (14822) RATED HEAT INPUT CAPACITY means the heat input capacity as specified by the permit issued by the Executive Officer, or if not specified on the permit, on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.
- (23) RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.
- (1924) SCHOOL means any public or private school, including juvenile detention facilities with classrooms, used for purposes of the education of more than 12 children at the school, including in kindergarten and grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes. The term includes any building or

structure, playground, athletic field, or other area of school property, but does not include unimproved school property.

(2025) STANDBY BOILER is a boiler which operates as a temporary replacement for primary steam or hot water while the primary steam or hot water supply unit is out-of-service.

(2126) THERM means 100,000 Btu.

(2227) THERMAL FLUID HEATER means a natural gas fired PROCESS HEATER in which a process is heated indirectly by a heated fluid other than water.

(2328) UNIT means any boiler, steam generator, or process heater as defined in paragraph (b)(5) or (b)(4721) of this subdivision.

(c) Requirements

Notwithstanding the exemptions contained in Table 1 – Existing Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions, of subdivision (j) of Rule 2001, the owner or operator of any unit(s) subject to this rule shall not operate the unit in a manner that exceeds the emission limits specified in (c)(1), (c)(2), (c)(3), and (c)(4).

(1) The owner or operator shall subject all of the units within the facility to the applicable NOx emission limits and schedules specified in Table 1146-1:

Table 1146-1 – Standard Compliance Limits and Schedule

Rule Reference	Category	Limit ¹	Submit Compliance Plan on or before	Submit Application for Permit to Construct on or before	Unit Shall be in Full Compliance on or before Compliance Schedule for NON-RECLAIM Facilities	Compliance Schedule for RECLAIM and FORMER RECLAIM Facilities
(c)(1)(A)	All Units Fired on Gaseous Fuels	30 ppm or for natural gas fired units 0.036 lbs/10 ⁶ Btu	-	-	September 5, 2008	See Rule 1100 = Implementation Schedule for NOx Facilities
(c)(1)(B)	Any Units Fired on Non-gaseous Fuels	40 ppm	-	-	September 5, 2008	
(c)(1)(C)	Any Units Fired on Landfill Gas	25 ppm	-	-	January 1, 2015	
(c)(1)(D)	Any Units Fired on Digester Gas	15 ppm	-	-	January 1, 2015	
(c)(1)(E)	Atmospheric Units	12 ppm or 0.015 lbs/10 ⁶ Btu	January 1, 2010	January 1, 2013	January 1, 2014	
(c)(1)(F)	Group I Units	5 ppm or 0.0062 lbs/10 ⁶ Btu	-	January 1, 2012	January 1, 2013	
(c)(1)(G)	Group II Units (with an existing NOx limit >12 ppm) 75% or more of units (by heat input)	5 ppm or 0.0062 lbs/10 ⁶ Btu 9 ppm or 0.011 lbs/10 ⁶ Btu	January 1, 2010	January 1, 2011	January 1, 2012 January 1, 2016	
(c)(1)(H)	Group II Units (with an existing NOx limit <12 ppm) 100% of units (by heat input)	7 ppm or 0.0085 lbs/10 ⁶ Btu for fire-tube boilers only; 9 ppm or 0.011 lbs/10 ⁶ Btu for all others	January 1, 2010	January 1, 2013	January 1, 2014 See (c)(7)(A)	
(c)(1)(I)	Group III Units (Fire-tube Boilers Only) 75% or more of units (by heat input)	7 ppm or 0.0085 lbs/10 ⁶ Btu 9 ppm or 0.011 lbs/10 ⁶ Btu	January 1, 2011	January 1, 2012	January 1, 2013 See (c)(7)(B)	
(c)(1)(J)	Group III Units (Excluding Fire-tube Boilers) 100% of units (by heat input)	9 ppm or 0.011 lbs/10 ⁶ Btu	January 1, 2011	January 1, 2014	January 1, 2015	
(c)(1)(K)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10 ⁶ Btu			See (c)(7)(C) for units with an existing NOx limit < 20 ppm See (e)(2) for units with an existing NOx limit >20 ppm	

¹ All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

~~Table 1146-2~~ Enhanced Compliance Limits and Schedule

Rule Reference	Category	Limit	Submit Compliance Plan on or before	Submit Application for Permit to Construct on or before	Unit Shall be in Full Compliance on or before
(e)(2)(A)	Group II Units 75% or more of units (by heat input)	5 ppm or 0.0062 lbs/10 ⁶ Btu	January 1, 2011	January 1, 2013	January 1, 2014
(e)(2)(B)	Group II Units 100% of units (by heat input)		January 1, 2011	January 1, 2015	January 1, 2016

(2) The owner or operator of any unit(s) operating with an air pollution control equipment that results in ammonia emissions in the exhaust shall not discharge into the atmosphere ammonia emissions in excess of 5 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes).

(3) For dual fuel co-fired combustion a weighted average limit calculated by Equation 1146-1 may be used provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(89), for units burning a combination of both fuels.

$$\text{Weighted Limit} = \frac{(\text{CL}_A \times \text{Q}_A) + (\text{CL}_B \times \text{Q}_B)}{\text{Q}_A + \text{Q}_B} \quad \text{Equation 1146-1}$$

Where:

CL_A = compliance limit for fuel A

CL_B = compliance limit for fuel B

Q_A = heat input from fuel A

Q_B = heat input from fuel B

(4) The owner or operator of any unit(s) with a heat input capacity greater than or equal to 5 million Btu per hour shall not discharge into the atmosphere carbon monoxide (CO) emissions in excess of 400 ppm (referenced at 3

percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) or for natural gas fired units 0.30 lbs/10⁶ Btu.

- (5) In lieu of complying with the applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), ~~and (c)(4)~~, (e)(1), and (e)(2), the owner or operator of any unit(s) in operation prior to September 5, 2008 for non-RECLAIM facilities, or in operation prior to [12 months after date of amendment] for RECLAIM or former RECLAIM facilities with an annual heat input less than or equal to 9.0×10^9 Btu (90,000 therms) per year, shall:
- (A) operate the unit(s) in a manner that maintains stack gas oxygen concentrations at less than or equal to 3 percent on a dry basis for any 15-consecutive-minute averaging period; or
 - (B) tune the unit(s) at least twice per year, (at intervals from 4 to 8 months apart) in accordance with the procedure described in Attachment 1 or the unit manufacturer's specified tune-up procedure. If a different tune-up procedure from that described in Attachment 1 is used then a copy of this procedure shall be kept on site. The owner or operator of any unit(s) selecting the tune-up option shall maintain records for a rolling twenty four month period verifying that the required tune-ups have been performed. If the unit does not operate throughout a continuous six-month period within a twelve month period, only one tune-up is required for the twelve month period that includes the entire period of non-operation. For this case, the tune-up shall be conducted within thirty (30) days of start-up. No tune-up is required during a rolling twelve month period for any unit that is not operated during that rolling twelve month period; this unit may be test fired to verify availability of the unit for its intended use but once the test firing is completed the unit shall be shutdown. Records of test firings shall be maintained for a rolling twenty four month period, and shall be made accessible to an authorized District representative upon request.
- (6) Notwithstanding the exemptions contained in Table 1 – Existing Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions, of subdivision (j) of Rule 2001, Any unit(s) with a rated heat input capacity greater than or equal to 40 million Btu per hour and an annual heat input greater than 200×10^9 Btu per year shall have a continuous in-

stack nitrogen oxides monitor or equivalent verification system in compliance with Rule 218, Rule 218.1, and 40 CFR part-Part 60 Appendix B Specification 2. Maintenance and emission records shall be maintained and made accessible for a period of two years to the Executive Officer.

- (7) Notwithstanding paragraph (c)(1), aAn owner or operator of a non-RECLAIM facility that has installed or modified the following units prior to [date of amendment] shall meet the NOx emission limit specified in Table 1146-1 by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier;a Group III natural gas fired unit prior to September 5, 2008 complying with the applicable BACT emission limit of 12 ppm or less of NOx may defer compliance with subparagraphs (c)(1)(I) or (c)(1)(J) until the unit's burner(s) replacement.

(A) Group II units subject to subparagraph (c)(1)(H) with a NOx emission limit of 9 ppm or less as specified in a SCAQMD Permit to Operate; or

(B) Group III units subject to subparagraph (c)(1)(I) or (c)(1)(J) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or

(C) Thermal fluid heaters subject to subparagraph (c)(1)(K) with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate.

- (8) An owner or operator of a non-RECLAIM facility that has installed or modified prior to [date of amendment] any unit(s) operating with an air pollution control equipment that results in ammonia emissions in the exhaust complying, as specified in a SCAQMD Permit to Operate, with an emission limit greater than 5 ppm shall meet the ammonia emission limit in (c)(2) when the air pollution control equipment is replaced or modified.

- (89) Any owner or operator who chooses the pound per million Btu compliance option specified in paragraph(s) (c)(1) ~~(e)(2)~~,—or (c)(4) or chooses the weighted average emission limit using Equation 1146-1 under paragraph (c)(3) shall install a non-resettable totalizing fuel meter to measure the total of each fuel used by each individual unit, as approved by the Executive Officer.

- ~~(9) The owner or operator of Group II or III units shall submit for the approval of the Executive Officer a compliance plan in accordance with the~~

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~~requirements of Rule 221—Plans and Rule 306—Plan Fees by the applicable date specified in Tables 1146-1 or 1146-2. The compliance plan shall include the following information:~~

- ~~(A) Owner/operator contact information (company name, AQMD facility identification number, contact name, phone number, address, e-mail address).~~
- ~~(B) Number and size (mmbtu/hr) of Group II and III units located at the facility.~~
- ~~(C) Selection of the Standard (Table 1146-1) or Enhanced (Table 1146-2) compliance schedule by Group II and III units.~~
- ~~(D) The owner or operator of more than one unit located within the same facility that have opted to divide the units by heat input for the purpose of separate compliance dates according to Tables 1146-1 or 1146-2 shall indicate which units are categorized 75 percent or more of the heat input and which units make up the remaining 100 percent of the heat input.~~

- (10) ~~On or after January 1, 2015, a~~An owner or operator of any landfill or digester gas (biogas) unit co-fired with natural gas shall not operate the unit in a manner that exceeds the emission concentration limits specified in subparagraphs (c)(1)(C) or (c)(1)(D), provided that the facility monthly average biogas usage by the biogas units is 90% or more, based on the higher heating value of the fuels used.

- (A) The Executive Officer may approve the burning of more than 10% up to:
 - (i) 25% natural gas in a biogas fired unit at the 15 ppm (digester gas) or 25 ppm (landfill gas) NOx level, when it is necessary, if the only alternative to limiting natural gas to 10% would be shutting down the unit and flaring more biogas.
 - (ii) 50% natural gas in a digester gas-fired unit at the 15 ppm NOx level, when it is necessary as specified in clause (c)(10)(A)(i) and for units installed on or after September 5, 2008 provided the unit has demonstrated compliance with the NOx limits in paragraph (c)(1) applicable to units fired exclusively on natural gas.

For units subject to this subparagraph, the percent natural gas usage shall be based on the facility monthly average biogas usage by the biogas units and the higher heating value of the fuels used.

- (B) Any biogas-fired unit burning more than the approved percent natural gas as determined under subparagraph (c)(10)(A) shall comply with the weighted average NO_x limit specified in paragraph (c)(3).

(d) Compliance Determination

- (1) An owner or operator of any unit(s) shall have the option of complying with either the pound per million Btu or parts per million emission limits specified in paragraphs (c)(1), ~~(c)(2)~~, (c)(3), and (c)(4).

- (2) All emission determinations shall be made in the as-found operating condition, except no compliance determination shall be established during start-up, shutdown, or under breakdown conditions. Start-ups or shutdowns shall not last longer than is necessary to reach stable conditions. Compliance determination as specified in paragraph (d)(6) shall be conducted at least 250 operating hours, or at least thirty days subsequent to the tuning or servicing of any unit, unless it is an unscheduled repair.

- ~~(3) All parts per million emission limits specified in subdivision (c) are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.~~

- (3) No later than 12 months after unit operation and annually within 12 months thereafter, an owner or operator of a unit subject to the ammonia emission limit specified in paragraph (c)(2) shall conduct a source test to demonstrate compliance with the ammonia emission limit, according to the procedures in District Source Test Method 207.1 for Determination of Ammonia Emissions from Stationary Sources.

- (4) Compliance with the NO_x and CO emission requirements of paragraphs (c)(1), ~~(c)(2)~~, (c)(3), and (c)(4) and the stack-gas oxygen concentration requirement of subparagraph (c)(5)(A) shall be determined using a District approved contractor under the Laboratory Approval Program according to the following procedures:

- (A) District Source Test Method 100.1 - Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989), or

- (B) District Source Test Method 7.1 - Determination of Nitrogen Oxide Emissions from Stationary Sources (March 1989) and District Source Test Method 10.1 - Carbon Monoxide and Carbon Dioxide by Gas Chromatograph/Non-Dispersive Infrared Detector (GC/NDIR) - Oxygen by Gas Chromatograph-Thermal Conductivity (GC/TCD) (March 1989); or
- (C) United States Environmental Protection Agency Conditional Test Method CTM-030, Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers and Process Heaters Using Portable Analyzers; or
- (D) ASTM D6522-00(2005) Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers
- (E) any other test method determined to be alternative and approved before the test in writing by the Executive Officers of the District and the California Air Resources Board and the Regional Administrator of the United States Environmental Protection Agency, Region IX; or
- (F) a continuous in-stack nitrogen oxide monitor or equivalent verification system as specified in paragraph (c)(6).

Records of all source tests shall be made available to District personnel upon request. Emissions determined to exceed any limits established by this rule through the use of any of the above-referenced test methods shall constitute a violation of this rule.

- (5) For any owner or operator who chooses the pound per million Btu of heat input compliance option of paragraph (c)(1), ~~(c)(2)~~, (c)(3), or (c)(4), NO_x emissions in pounds per million Btu of heat input shall be calculated using procedures in 40 CFR Part 60, Appendix A, Method 19, Sections 2 and 3 and CO emissions in pounds per million Btu of heat input shall be calculated according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1.
- (6) Compliance determination with the NO_x emission requirements in paragraph (d)(4) shall be conducted once:

- (A) every three years for units with a rated heat input greater than or equal to 10 million Btu per hour, except for units subject to paragraph (c)(6).
 - (B) every five years for units with a rated heat input less than 10 million Btu per hour down to and including 5 million Btu per hour.
- (7) Provided the emissions test is conducted within the same calendar year as the test required in paragraph (d)(6), an owner or operator may use the following emissions tests to comply with paragraph (d)(6):
- (A) Periodic monitoring or testing of a unit as required in a Title V permit pursuant to Regulation XXX, or
 - (B) Relative accuracy testing for continuous emissions monitoring verification pursuant to Rule 218.1 or 40 CFR ~~part~~Part 60 Appendix B Specification 2.
- (8) Except for units subject to paragraph (c)(6), ~~Any~~any owner or operator of units subject to this rule shall perform diagnostic emission checks of NOx emissions with a portable NOx, CO and oxygen analyzer according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1 according to the following schedule:
- (A) ~~On or after July 1, 2009,~~The owner or operator of units subject to paragraphs (c)(1), ~~(e)(2), (c)(3), and or (c)(4)~~ shall check NOx emissions at least monthly or every 750 unit operating hours, whichever occurs later. If a unit is in compliance for three consecutive diagnostic emission checks, without any adjustments to the oxygen sensor set points, then the unit may be checked quarterly or every 2,000 unit operating hours, whichever occurs later, until the resulting diagnostic emission check ~~exceeds~~ the applicable limit specified in paragraphs (c)(1), ~~(e)(2), or (c)(3).~~
 - (B) On or after ~~January 1, 2015~~15 years after the date of amendment ~~or during burner replacement when 50 percent or more of the unit's burners are replaced, whichever occurs later~~is earlier, the owner or operator of units ~~subject to complying with the requirements specified in~~ paragraph (c)(5) shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(5)(B).

- (C) Records of all monitoring data required under subparagraphs (d)(8)(A) and (d)(8)(B) shall be maintained for a rolling twelve month period of two years (5 years for Title V facilities) and shall be made available to District personnel upon request.
- (D) The portable analyzer diagnostic emission checks required under subparagraph (d)(8)(A) and (d)(8)(B) shall only be conducted by a person who has completed an appropriate District-approved training program in the operation of portable analyzers and has received a certification issued by the District.
- (9) An owner or operator shall comply with the requirements as applied to CO emissions specified in paragraph (d)(8) -and subparagraph:
 - (A) (d)(6)(A) for units greater than or equal to 10 million Btu per hour~~mmmbtu/hr~~, or
 - (B) (d)(6)(B) for units less than 10 million Btu per hour~~mmmbtu/hr~~.
- (10) A diagnostic emission check conducted under the requirements specified in paragraph (d)(8) that finds emissions in excess of those allowed by this rule or a permit condition shall not constitute a violation of this rule if the owner or operator corrects the problem and demonstrate compliance with another emission check within 72 hours from the time the owner or operator knew of excess emissions, or reasonably should have known, or shut-down the unit by the end of an operating cycle, whichever is sooner.
- (11) Notwithstanding the requirements specified in paragraph (d)(10) any diagnostic emission check conducted by District staff that finds emissions in excess of those allowed by this rule or a permit condition is a violation.
- (12) An owner or operator may opt to lower the unit's rated heat input capacity. The lowered rated heat input capacity shall not be less than or equal to 2 million Btu per hour and shall be based on manufacturer's identification or rating plate or permit condition.
- (e) Compliance Schedule
 - ~~(1) An owner or operator of units subject to paragraph (e)(1) shall comply with the schedule specified in Table 1146-1.~~
 - ~~(2) An owner or operator of units subject to paragraph (e)(2) shall comply with the schedule specified in Table 1146-2.~~
 - (1) The owner or operator of a RECLAIM or former RECLAIM facility with any unit(s) subject to paragraph (c)(1) shall meet the applicable NOx

emission limit in Table 1146-1 in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities.

- (2) An owner or operator of a non-RECLAIM facility with any thermal fluid heaters with a NOx emission limit greater than 20 ppm shall:

 - (A) On or before [12 months after date of amendment], submit a complete SCAQMD permit application for each thermal fluid heater that does not currently meet the limit specified in subparagraph (c)(1)(K); and
 - (B) On or before January 1, 2022, meet the applicable NOx emission limit in Table 1146-1 for thermal fluid heaters subject to subparagraph (c)(1)(K).
- (3) On or after January 1, 2015 [15 years after the date of amendment] or during burner replacement when 50 percent or more of the unit's burners are replaced, whichever occurs later is earlier, no person shall operate in the District any unit subject to complying with paragraph (c)(5) which that discharges into the atmosphere NOx emission in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) does not meet the emissions limits specified in subparagraph (c)(1)(A) of Table 1146-1.
- (4) Any unit subject to complying with the requirements specified in paragraph (c)(5) that exceeds 90,000 therms of heat input from all fuels used in any twelve month period, the owners or operators shall:

 - (A) within 4 months after exceeding 90,000 therms of heat input in any twelve month period, submit required applications for permits to construct and operate; and
 - (B) within 18 months after exceeding 90,000 therms of heat input in any twelve month period, demonstrate and maintain compliance with all applicable requirements of paragraphs (c)(1), (c)(2), (c)(3), and (c)(6) for the life of the unit.
- (5) The Executive Officer shall grant a time extension to the full compliance date with the applicable NOx compliance limits specified in subparagraphs (c)(1)(E) through (c)(1)(J) and paragraph (c)(2) for any health facility as defined in Section 1250 of the California Health and Safety Code that can demonstrate that the Office of Statewide Health Planning and Development has approved an extension of time to comply with seismic safety requirements pursuant to Health and Safety Code Sections 130060 and

130061.5. The extension of time granted by the Executive Officer shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130060 but not to exceed January 1, 2015 and shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130061.5 but not to exceed January 1, 2020. Those health facilities granted a time extension shall submit a compliance plan to the Executive Officer on or before January 1, 2010.

(f) Exemptions

The provisions of this rule shall not apply to:

- (1) boilers used by electric utilities to generate electricity; or
- (2) boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; or
- (3) sulfur plant reaction boilers; or
- (4) any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.

ATTACHMENT 1

A. Equipment Tuning Procedure¹ for Forced-Draft Boilers, Steam Generators, and Process Heaters

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number² (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values³, and if CO emissions are low and there is not smoke, the unit is probably operating at near optimum efficiency - at this particular firing rate.

However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the

¹ This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the United States EPA.

² The smoke-spot number can be determined with ASTM Test Method D-2156 or with the Bacharach method. ASTM Test Method D-2156 is included in a tuneup kit that can be purchased from the Bacharach Company.

³ Typical minimum oxygen levels for boilers at high firing rates are:

1. For natural gas: 0.5% - 3%
2. For liquid fuels: 2% - 4%

- stack gas temperature, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.
4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.
 5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
 - a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
 - b. Stack gas CO concentrations greater than 400 ppm.
 - c. Smoking at the stack.
 - d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.
 6. Develop an O₂/CO curve (for gaseous fuels) or O₂/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.

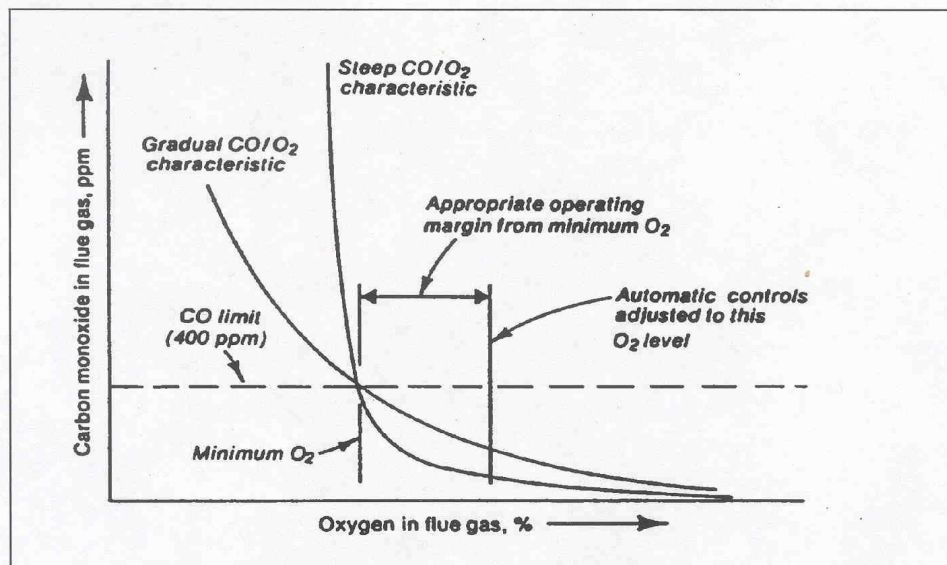


Figure 1 Oxygen/CO Characteristic Curve

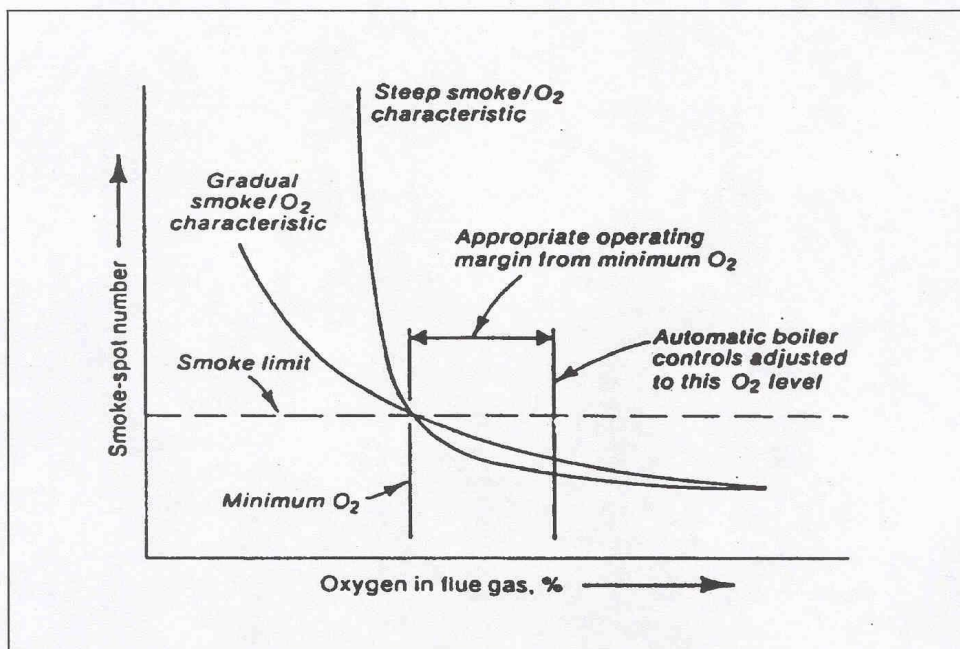


Figure 2 Oxygen/Smoke Characteristic Curve

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

<u>Fuel</u>	<u>Measurement</u>	<u>Value</u>
Gaseous	CO Emissions	400 ppm
#1 and #2 oils	smoke-spot number	number 1
#4 oil	smoke-spot number	number 2
#5 oil	smoke-spot number	number 3
Other oils	smoke-spot number	number 4

The above conditions are referred to as the CO or smoke thresholds, or as the minimum excess oxygen level.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent O₂ to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.

9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.
10. Verify that the new settings can accommodate the sudden load changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.
11. When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or heater records indicating name and signature of person, title, and date the tuneup was performed.

B. Equipment Tuning Procedure for Natural Draft-Fired Boilers, Steam Generators, and Process Heaters.

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant codes, regulations, and equipment manufacturers specifications and operating manuals.

Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

1. PRELIMINARY ANALYSIS

- a. **CHECK THE OPERATING PRESSURE OR TEMPERATURE.**
Operate the boiler, steam generator, or heater at the lowest acceptable pressure or temperature that will satisfy the load demand. This will minimize heat and radiation losses. Determine the pressure or temperature

that will be used as a basis for comparative combustion analysis before and after tuneup.

b. **CHECK OPERATING HOURS.**

Plan the workload so that the boiler, steam generator, or process heater operates only the minimum hours and days necessary to perform the work required. Fewer operating hours will reduce fuel use and emissions. For units requiring a tuneup to comply with the rule, a totalizing non-resettable fuel meter will be required for each fuel used and for each boiler, steam generator, and heater to prove fuel consumption is less than the heat input limit in therms per year specified in the rule.

c. **CHECK AIR SUPPLY.**

Sufficient fresh air supply is essential to ensure optimum combustion and the area of air supply openings must be in compliance with applicable codes and regulations. Air openings must be kept wide open when the burner is firing and clear from restriction to flow.

d. **CHECK VENT.**

Proper venting is essential to assure efficient combustion. Insufficient draft or overdraft promotes hazards and inefficient burning. Check to be sure that vent is in good condition, sized properly and with no obstructions.

e. **COMBUSTION ANALYSIS.**

Perform an "as is" combustion analysis (CO, O₂, etc.) with a warmed up unit at high and low fire, if possible. In addition to data obtained from combustion analysis, also record the following:

- i. Inlet fuel pressure at burner (at high & low fire)
- ii. Draft at inlet to draft hood or barometric damper
 - 1) Draft hood: high, medium, and low
 - 2) Barometric Damper: high, medium, and low
- iii. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the boiler, steam generator, or process heater.
- iv. Unit rate if meter is available.

With above conditions recorded, make the following checks and corrective actions as necessary:

2. CHECKS & CORRECTIONS

a. **CHECK BURNER CONDITION.**

Dirty burners or burner orifices will cause boiler, steam generator, or process heater output rate and thermal efficiency to decrease. Clean burners and burner orifices thoroughly. Also, ensure that fuel filters and moisture traps are in place, clean, and operating properly, to prevent plugging of gas orifices. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Look for any burned-off or missing burner parts, and replace as needed.

b. **CHECK FOR CLEAN BOILER, STEAM GENERATOR, OR PROCESS HEATER TUBES & HEAT TRANSFER SURFACES.**

External and internal build-up of sediment and scale on the heating surfaces creates an insulating effect that quickly reduces unit efficiency. Excessive fuel cost will result if the unit is not kept clean. Clean tube surfaces, remove scale and soot, assure proper process fluid flow and flue gas flow.

c. **CHECK WATER TREATMENT & BLOWDOWN PROGRAM.**

Soft water and the proper water or process fluid treatment must be uniformly used to minimize scale and corrosion. Timely flushing and periodic blowdown must be employed to eliminate sediment and scale build-up on a boiler, steam generator or process heater.

d. **CHECK FOR STEAM, HOT WATER OR PROCESS FLUID LEAKS.**

Repair all leaks immediately since even small high-pressure leaks quickly lead to considerable fuel, water and steam losses. Be sure there are no leaks through the blow-off, drains, safety valve, by-pass lines or at the feed pump, if used.

3. **SAFETY CHECKS**

a. Test primary and secondary low water level controls.

b. Check operating and limit pressure and temperature controls.

c. Check pilot safety shut off operation.

d. Check safety valve pressure and capacity to meet boiler, steam generator or process heater requirements.

e. Check limit safety control and spill switch.

4. ADJUSTMENTS

While taking combustion readings with a warmed up boiler, steam generator, or process heater at high fire perform checks and adjustments as follows:

- a. Adjust unit to fire at rate; record fuel manifold pressure.
- b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at both high, medium and low fire. Carbon Monoxide (CO) value should always be below 400 parts per million (PPM) at 3% O₂. If CO is high make necessary adjustments.

Check to ensure boiler, steam generator, or process heater light offs are smooth and safe. A reduced fuel pressure test at both high and low fire should be conducted in accordance with the manufacturers instructions and maintenance manuals.

- c. Check and adjust operation of modulation controller. Ensure proper, efficient and clean combustion through range of firing rates.

When above adjustments and corrections have been made, record all data.

5. FINAL TEST

Perform a final combustion analysis with a warmed up boiler, steam generator, or process heater at high, medium and low fire, whenever possible. In addition to data from combustion analysis, also check and record:

- a. Fuel pressure at burner (High, Medium, and Low).
- b. Draft above draft hood or barometric damper (High, Medium and Low).
- c. Steam pressure or water temperature entering and leaving boiler, steam generator, or process heater.
- d. Unit rate if meter is available.

When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or process heater records indicating name and signature of person, title, company name, company address and date the tuneup was performed.

APPENDIX A-2

Proposed Amended Rule 1146.1

(Adopted October 5, 1990)(Amended July 10, 1992)(Amended May 13, 1994)
(Amended September 5, 2008)(Amended November 1, 2013)
(PAR September 18, 2018)

RULE 1146.1 EMISSIONS OF OXIDES OF NITROGEN FROM SMALL INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

(a) Applicability

This rule applies to boilers, steam generators, and process heaters that are greater than 2 million Btu per hour and less than 5 million Btu per hour rated heat input capacity used in any industrial, institutional, or commercial operation, ~~with the exception of RECLAIM facilities (NOx emissions only).~~

(b) Definitions

- (1) ADSORPTION CHILLER UNIT means any natural gas fired unit that captures and uses waste heat to provide cold water for air conditioning and other process requirements.
- (2) ANNUAL HEAT INPUT means the ~~actual amount of heat released by fuels burned in heat input to~~ a unit during a calendar year, based on the fuel's higher heating value.
- (3) ATMOSPHERIC UNIT means any natural gas fired unit with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.
- (4) BOILER OR STEAM GENERATOR means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel, used to produce steam or to heat water, and that is not used exclusively to produce electricity for sale. Boiler or Steam Generator does not include any open heated tank, adsorption chiller unit, or waste heat recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment.
- (5) BTU means British thermal unit or units.
- (6) COMMERCIAL OPERATION means any office building, lodging place, or similar location designed for tenancy by one or more business entities or residential occupants.

- (7) FIRE-TUBE BOILER means any BOILER that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam.
- (8) FORMER RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.
- (79) HEALTH FACILITY has the same meaning as defined in Section 1250 of the California Health and Safety Code.
- (810) INDUSTRIAL OPERATION means any entity engaged in the production and/or provision of chemicals, foods, textiles, fabricated metal products, real estate, personal services or other kindred or allied products or services.
- (911) INSTITUTIONAL OPERATION means any public or private establishment constituted to provide medical, educational, governmental, or other similar services to promote safety, order, and welfare.
- (12) MODIFICATION means any physical change that meets the criteria set forth in Rule 1302 – Definitions.
- (13) NON-RECLAIM facility means a facility that was not in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.
- (1014) NOx EMISSIONS means the sum of nitric oxides and nitrogen dioxides in the flue gas emitted, collectively expressed as nitrogen dioxide.
- (1415) OPEN HEATED TANK means a non-pressurized self-heated tank that may include a cover or doors that can be opened or detached to put in or remove parts, components or other material for processing in the tank. Tanks heated solely by an electric heater, boiler, thermal fluid heater or heat recovered from another process using heat exchangers are excluded from this definition.
- (1216) PROCESS HEATER means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven 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.

(1317) **RATED HEAT INPUT CAPACITY** means the heat input capacity as specified by the permit issued by the Executive Officer, or if not specified on the permit, on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.

(18) **RECLAIM FACILITY** means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(1419) **SCHOOL** means any public or private school, including juvenile detention facilities with classrooms, used for purposes of the education of more than 12 children at the school, including in kindergarten and grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes. The term includes any building or structure, playground, athletic field, or other area of school property, but does not include unimproved school property.

(1520) **THERM** means 100,000 Btu.

(1621) **THERMAL FLUID HEATER** means a natural gas fired PROCESS HEATER in which a process is heated indirectly by a heated fluid other than water.

(1722) **UNIT** means any boiler, steam generator, or process heater as defined in paragraph (b)(4) or (b)(1216).

(c) Requirements

Notwithstanding the exemptions contained in Table 1 – Existing Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions, of subdivision (j) of Rule 2001, the owner or operator of any unit(s) subject to this rule shall not operate the unit in a manner that exceeds the emission limits specified in (c)(1), (c)(2), and (c)(3).

~~(1) — On or after September 5, 2008, the owner or operator of any unit subject to subdivision (a) shall operate such unit so that it discharges into the atmosphere no more than 30 ppm of NOx emissions or for natural gas fired units 0.037 pound NOx per million Btu of heat input, as specified in the permit to operate.~~

- (21) An owner or operator of any unit subject to subdivision (a) must select to comply with ~~one the applicable of the following~~ NOx emission limits specified in Table 1146.1-1; and apply for a permit to construct to operate such unit in compliance with the selected emission limit and the corresponding permit application and full compliance dates.

Table 1146.1-1

<u>Rule Reference</u>	<u>Category</u>	<u>Limit¹</u>	<u>Submit Application for Permit to Construct on or before</u>	<u>Unit Shall be in Full Compliance on or before</u> <u>Compliance Schedule for NON-RECLAIM Facilities</u>	<u>Compliance Schedule for RECLAIM and FORMER RECLAIM Facilities</u>
<u>(c)(1)(A)</u>	<u>All Other Units</u>	<u>30 ppm or for natural gas fired units 0.036 lbs/10⁶ Btu</u>		<u>September 5, 2008</u>	<u>See Rule 1100 – Implementation Schedule for NOx Facilities</u>
<u>(c)(1)(B)</u>	<u>Any Units Fired on Landfill Gas</u>	<u>25 ppm</u>	<u>January 1, 2014</u>	<u>January 1, 2015</u>	
<u>(c)(1)(C)</u>	<u>Any Units Fired on Digester Gas</u>	<u>15 ppm</u>	<u>January 1, 2014</u>	<u>January 1, 2015</u>	
<u>(c)(1)(D)</u>	<u>Atmospheric Units</u>	<u>12 ppm or 0.015 -lbs/10⁶ Btu</u>	<u>January 1, 2013</u>	<u>January 1, 2014</u>	
<u>(c)(1)(E)</u>	<u>Any Units Fired on Natural Gas, Excluding Fire-tube Boilers Units Located at Schools and Universities, Atmospheric Units, and Thermal Fluid Heaters</u>	<u>9 ppm or 0.011 lbs/10⁶ Btu</u>	<u>January 1, 2011</u>	<u>January 1, 2012</u>	
	<u>Any Units Fired on Natural Gas Located at Schools and Universities, Excluding Atmospheric Units, and Thermal Fluid Heaters</u>		<u>January 1, 2013</u>	<u>See (c)(5)(A)</u> <u>January 1, 2014</u>	
<u>(c)(1)(F)</u>	<u>Any Fire-tube Boilers Fired on Natural Gas</u>	<u>7 ppm or 0.0085 lbs/10⁶ Btu</u>			
<u>(c)(1)(G)</u>	<u>Thermal Fluid Heaters</u>	<u>12 ppm or 0.015 lbs/10⁶ Btu</u>		<u>See (c)(5)(B) for units with an existing NOx limit ≤ 20 ppm</u> <u>See (e)(2) for units with an existing NOx limit >20 ppm</u>	

¹ All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

- (21) An owner or operator of any unit subject to subdivision (a) must select to comply with ~~one the applicable of the following~~ NOx emission limits specified in Table 1146.1-1; and apply for a permit to construct to operate such unit in compliance with the selected emission limit and the corresponding permit application and full compliance dates.

Table 1146.1-1

<u>Rule Reference</u>	<u>Category</u>	<u>Limit¹</u>	<u>Submit Application for Permit to Construct on or before</u>	<u>Unit Shall be in Full Compliance on or before</u> <u>Compliance Schedule for NON-RECLAIM Facilities</u>	<u>Compliance Schedule for RECLAIM and FORMER RECLAIM Facilities</u>
<u>(c)(1)(A)</u>	<u>All Other Units</u>	<u>30 ppm or for natural gas fired units 0.036 lbs/10⁶ Btu</u>		<u>September 5, 2008</u>	<u>See Rule 1100 – Implementation Schedule for NOx Facilities</u>
<u>(c)(1)(B)</u>	<u>Any Units Fired on Landfill Gas</u>	<u>25 ppm</u>	<u>January 1, 2014</u>	<u>January 1, 2015</u>	
<u>(c)(1)(C)</u>	<u>Any Units Fired on Digester Gas</u>	<u>15 ppm</u>	<u>January 1, 2014</u>	<u>January 1, 2015</u>	
<u>(c)(1)(D)</u>	<u>Atmospheric Units</u>	<u>12 ppm or 0.015 -lbs/10⁶ Btu</u>	<u>January 1, 2013</u>	<u>January 1, 2014</u>	
<u>(c)(1)(E)</u>	<u>Any Units Fired on Natural Gas, Excluding Fire-tube Boilers Units Located at Schools and Universities, Atmospheric Units, and Thermal Fluid Heaters</u>	<u>9 ppm or 0.011 lbs/10⁶ Btu</u>	<u>January 1, 2011</u>	<u>January 1, 2012</u>	
	<u>Any Units Fired on Natural Gas Located at Schools and Universities, Excluding Atmospheric Units, and Thermal Fluid Heaters</u>		<u>January 1, 2013</u>	<u>See (c)(5)(A)</u> <u>January 1, 2014</u>	
<u>(c)(1)(F)</u>	<u>Any Fire-tube Boilers Fired on Natural Gas</u>	<u>7 ppm or 0.0085 lbs/10⁶ Btu</u>			
<u>(c)(1)(G)</u>	<u>Thermal Fluid Heaters</u>	<u>12 ppm or 0.015 lbs/10⁶ Btu</u>		<u>See (c)(5)(B) for units with an existing NOx limit ≤ 20 ppm</u> <u>See (e)(2) for units with an existing NOx limit >20 ppm</u>	

¹ All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

- (32) For dual fuel co-fired combustion units a weighted average limit calculated by Equation 1146.1-1 may be used provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(67), for units burning a combination of both fuels.

$$\text{Weighted Limit} = \frac{(CL_A \times Q_A) + (CL_B \times Q_B)}{Q_A + Q_B} \quad \text{Equation 1146.1-1}$$

Where:

CL_A = compliance limit for fuel A

CL_B = compliance limit for fuel B

Q_A = heat input from fuel A

Q_B = heat input from fuel B

- (43) The owner or operator of any unit(s) with a heat input capacity greater than 2 million Btu per hour shall not discharge into the atmosphere carbon monoxide (CO) emissions in excess of 400 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) or for natural gas fired units 0.30 lbs/10⁶ Btu.
- (54) In lieu of complying with the applicable emission limits specified in paragraph (c)(1), (c)(2), (c)(3), (e)(1), and (e)(2)(e)(4) any unit(s) subject to subdivision (a) in operation prior to September 5, 2008 for non-RECLAIM facilities, or in operation prior to [12 months after date of amendment] for RECLAIM or former RECLAIM facilities, and with an annual heat input of less than or equal to 18,000 therms per calendar year, shall:
- (A) be operated in a manner that maintains stack-gas oxygen concentrations at less than or equal to 3 percent on a dry basis for any 15-consecutive-minute averaging period; or
- (B) be tuned at least twice per year, (at intervals from four to eight months apart) in accordance with the procedure described in Attachment 1 or the unit manufacturer's specified tune-up procedure. If a different tune-up procedure from that described in attachment 1 is used then a copy of this procedure shall be kept on site. The owner or operator of any unit(s) selecting the tune-up option shall maintain records for a rolling of twenty four month period verifying that the required tune-ups have been performed. If

the unit does not operate throughout a continuous six-month period within 12 month period, only one tune-up is required for the twelve month period that includes the entire period of non-operation. For this case, the tune-up shall be conducted within 30 days of start-up. No tune-up is required during a rolling twelve month period for any unit that is not operated during that rolling 12 month period; this unit may be test fired to verify availability of the unit for its intended use but once test firing is completed it shall be shutdown. Records of test firings shall be maintained for a rolling twenty four month period, and shall be made accessible upon request from an authorized District representative upon request.

(65) Notwithstanding paragraph (c)(1), Aan owner or operator of a non-RECLAIM facility that has installed or modified the following units prior to [date of amendment] shall meet the NOx emission limit specified in Table 1146.1-1 by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier: a natural gas fired unit prior to September 5, 2008 complying with the applicable BACT emission limit of 12 ppm or less of NOx may defer compliance with paragraph (c)(2) until the unit's burner(s) replacement.

(A) Natural gas fired units subject to subparagraph (c)(1)(E) or (c)(1)(F) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or

(B) Thermal fluid heaters subject to subparagraph (c)(1)(G) with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate.

(76) Any owner or operator who chooses the pound per million Btu of heat input compliance option in paragraph (c)(1) or (c)(3), (e)(2), or (e)(4) for natural gas fired units or chooses the weighted average emission limit using Equation 1146.1-1 under paragraph (c)(32) shall install a non-resettable, totalizing fuel meter for each fuel used on an individual unit basis, as approved by the Executive Officer.

(87) ~~On or after January 1, 2015, a~~An owner or operator of any landfill or digester gas (biogas) unit co-fired with natural gas shall not operate the unit in a manner that exceeds the applicable landfill or digester gas emission concentration limits specified in paragraph (c)(21), provided that the facility

monthly average biogas usage by the biogas units is 90% or more, based on the higher heating value of the fuels used.

(A) The Executive Officer may approve the burning of more than 10% up to:

- (i) 25% natural gas in a biogas fired unit at the 15 ppm (digester gas) or 25 ppm (landfill gas) NOx level, when it is necessary, if the only alternative to limiting natural gas to 10% would be shutting down the unit and flaring more biogas.
- (ii) 50% natural gas in a digester gas-fired unit at the 15 ppm NOx level, when it is necessary as specified in clause (c) (87)(A)(i) and for units installed on or after September 5, 2008 provided the unit has demonstrated compliance with the NOx limits in paragraph (c)(21) applicable to units fired exclusively on natural gas.

For units subject to this subparagraph, the percent natural gas usage shall be based on the facility monthly average biogas usage by the biogas units and the higher heating value of the fuels used.

(B) Any biogas-fired unit burning more than the approved percent natural gas as determined under subparagraph (c)(87)(A) shall comply with the weighted average NOx limit specified in paragraph (c)(32).

(d) Compliance Determination

- (1) Owners or operators of any units shall have the option of complying with either the pound per million Btu of heat input or parts per million emission limits specified in paragraph (c)(1), (c)(2), or (c)(3), ~~or~~ (c)(4).
- (2) All emission determinations shall be made in the as-found operating condition, except no compliance determination shall be established during unit start-up, shutdown, or under breakdown conditions. Start-up or shutdown intervals shall not last longer than is necessary to reach stable temperatures. In no case shall the start-up or shutdown interval last longer than six hours or the time specified in the permit to operate, whichever is less. Start-ups and shutdowns shall not last longer than is necessary to reach stable conditions. A compliance determination as specified in paragraph (d)(65) shall be conducted at least 250 operating hours, or at least thirty days

subsequent to the tuning or servicing of any unit, unless it is an unscheduled repair.

~~(3) All parts per million emission limits specified in subdivision (c) are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.~~

(43) Compliance with the NO_x and CO emission requirements of paragraphs (c)(1) through (c)(43) and the stack-gas oxygen concentration requirement of subparagraph (c)(54)(A) shall be determined using a District approved contractor under the Laboratory Approval Program according to the following procedures:

- (A) District Source Test Method 100.1 - Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989); or
- (B) District Source Test Method 7.1 - Determination of Nitrogen Oxide Emissions from Stationary Sources (March 1989) and Method 10.1 - Carbon Monoxide and Carbon Dioxide by Gas Chromatograph/Non-Dispersive Infrared Detector (GC/NDIR) - Oxygen by Gas Chromatograph-Thermal Conductivity (GC/TCD) (March 1989); or
- (C) United States Environmental Protection Agency Conditional Test Method CTM-030, Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers and Process Heaters Using Portable Analyzers; or
- (D) ASTM D6522-00(2005) Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers
- (E) any other test method determined to be alternative and approved before the test in writing by the Executive Officers of the District and the California Air Resources Board and the Regional Administrator of the United States Environmental Protection Agency, Region IX.

Records of all source tests shall be maintained for a period of two years (five years for Title V facilities) and shall be made available to District personnel upon request. Emissions determined to exceed any limits

established by this rule through the use of any of the above-referenced test methods shall constitute a violation of this rule.

- (54) For any owner or operator who chooses the pounds-of per million Btu of heat input compliance option of paragraph (c)(1), (c)(2), or (c)(43) for natural gas fired units, NOx emissions in pounds per million Btu of heat input shall be calculated using the procedures in 40 CFR Part 60, Appendix A, Method 19, Sections 2 and 3 and CO emissions in pounds per million Btu of heat input shall be calculated according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1.
- (65) Compliance determination with the NOx emission requirements specified in paragraph (d)(43) shall be conducted once every five years.
- (76) Any owner or operator of units subject to this rule shall perform diagnostic emission checks of NOx emissions with a portable NOx, CO and oxygen analyzer according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1 according to the following schedule:
- (A) ~~On or after July 1, 2009, t~~The owner or operator of units subject to paragraphs (c)(1), (c)(2), or through (c)(43) shall check NOx emissions at least quarterly or every 2,000 unit operating hours, whichever occurs later. If a unit is in compliance for four consecutive required diagnostic emission checks, without any adjustments to the oxygen sensor set points, then the unit may be checked semi-annually or every 4,000 unit operating hours, whichever occurs later, until the diagnostic emission check exceeds the applicable limit specified in paragraphs (c)(1), or (c)(2), or ~~(c)(3).~~
- (B) On or after ~~January 1, 2015~~ [15 years after the date of amendment] or ~~during burner replacement when 50 percent or more of the unit's burners are replaced, whichever occurs later~~ is earlier, units ~~subject to complying with the requirements specified in paragraph (c)(54)~~ shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(54)(B).

- (C) Records of all monitoring data required under subparagraphs (d)(76)(A) and (d)(76)(B) shall be maintained for a rolling twelve month period of two years (five years for Title V facilities) and shall be made available to District personnel upon request.
- (D) The portable analyzer diagnostic emission checks required under subparagraphs (d)(76)(A) and (d)(76)(B) shall only be conducted by a person who has completed an appropriate District-approved training program in the operation of portable analyzers and has received a certification issued by the District.
- (87) An owner or operator shall comply with the requirements as applied to CO emissions specified in paragraphs (d)(65) and (d)(76).
- (98) A diagnostic emission check conducted under the requirements specified in paragraph (d)(76) that finds emissions in excess of those allowed by this rule or a permit condition shall not constitute a violation of this rule if the owner or operator corrects the problem and demonstrate compliance with another emission check within 72 hours from the time the owner or operator knew of excess emissions, or reasonably should have known, or shut down the unit by the end of an operating cycle, whichever is sooner.
- (109) Notwithstanding the requirements specified in paragraph (d)(98) any diagnostic emission check conducted by District staff that finds emissions in excess of those allowed by this rule or a permit condition is a violation.
- (110) An owner or operator may opt to lower the unit's rated heat input capacity. The lowered rated heat input capacity shall not be less than or equal to 2 million Btu per hour and shall be based on manufacturer's identification or rating plate or permit condition.
- (e) Compliance Schedule
 - ~~(1) Owners or operators of units shall comply with the applicable schedule specified in paragraphs (c)(1) and (c)(2).~~
 - (1) The owner or operator of a RECLAIM or former RECLAIM facility with any unit(s) subject to paragraph (c)(1) shall meet the applicable NOx emission limit in Table 1146.1-1 in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities.
 - (2) An owner or operator of a non-RECLAIM facility with any thermal fluid heaters with a NOx emission limit greater than 20 ppm shall:

- (A) On or before [12 months after date of amendment], submit a complete permit application for each thermal fluid heater that does not currently meet the limit specified in subparagraph (c)(1)(G); and
 - (B) On or before January 1, 2022, meet the applicable NOx emission limit in Table 1146.1-1 for thermal fluid heaters subject to subparagraph (c)(1)(G).
- (23) On or after January 1, 2015 [15 years after the date of amendment] or during burner replacement when 50 percent or more of the unit's burners are replaced, whichever is later, no person shall operate in the District any unit subject to complying with paragraph (c)(54) which that discharges into the atmosphere NOx emission in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) does not meet the emissions limits specified in paragraph (c)(1).
- (34) If any unit subject to complying with paragraph (c)(54) that exceeds 18,000 therms of annual heat input from all fuels used in any twelve month period, the owners or operators shall:
 - (A) within 4 months after exceeding 18,000 therms of heat input in any twelve month period, submit required applications for permits to construct and operate; and
 - (B) within 18 months after exceeding 18,000 therms of heat input in any twelve month period, demonstrate and maintain compliance with all applicable requirements specified in paragraphs (c)(1) through (c)(43) for the life of the unit.
- (45) The Executive Officer shall grant a time extension to the full compliance date with the applicable NOx compliance limits for any natural gas fired units specified in paragraph (c)(21) for any health facility as defined in Section 1250 of the California Health and Safety Code that can demonstrate that the Office of Statewide Health Planning and Development has approved an extension of time to comply with seismic safety requirements pursuant to Health and Safety Code Sections 130060 and 130061.5. The extension of time granted by the Executive Officer shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130060 but not to exceed January 1, 2015 and shall be consistent with the time extension granted pursuant to Health and Safety Code Section

130061.5 but not to exceed January 1, 2020. Those health facilities granted a time extension shall submit a compliance plan to the Executive Officer on or before January 1, 2010.

(f) Exemptions

The provisions of this rule shall not apply to any unit at a RECLAIM or former RECLAIM facility that is subject to a NO_x emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NO_x Facilities.

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)****ATTACHMENT 1****A. Equipment Tuning Procedure¹ for Forced-Draft Boilers, Steam Generators, and Process Heaters**

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number² (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values³, and if CO emissions are low and there is not smoke, the unit is probably operating at near optimum efficiency - at this particular firing rate.
3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the stack gas temperature, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.

However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

¹This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the United States EPA.

²The smoke-spot number can be determined with ASTM Test Method D-2156 or with the Bacharach method. ASTM Test Method D-2156 is included in a tuneup kit that can be purchased from the Bacharach Company.

³Typical minimum oxygen levels for boilers at high firing rates are:

1. For natural gas: 0.5% - 3%
2. For liquid fuels: 2% - 4%

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.
5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
 - a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
 - b. Stack gas CO concentrations greater than 400 ppm.
 - c. Smoking at the stack.
 - d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.
6. Develop an O₂/CO curve (for gaseous fuels) or O₂/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.

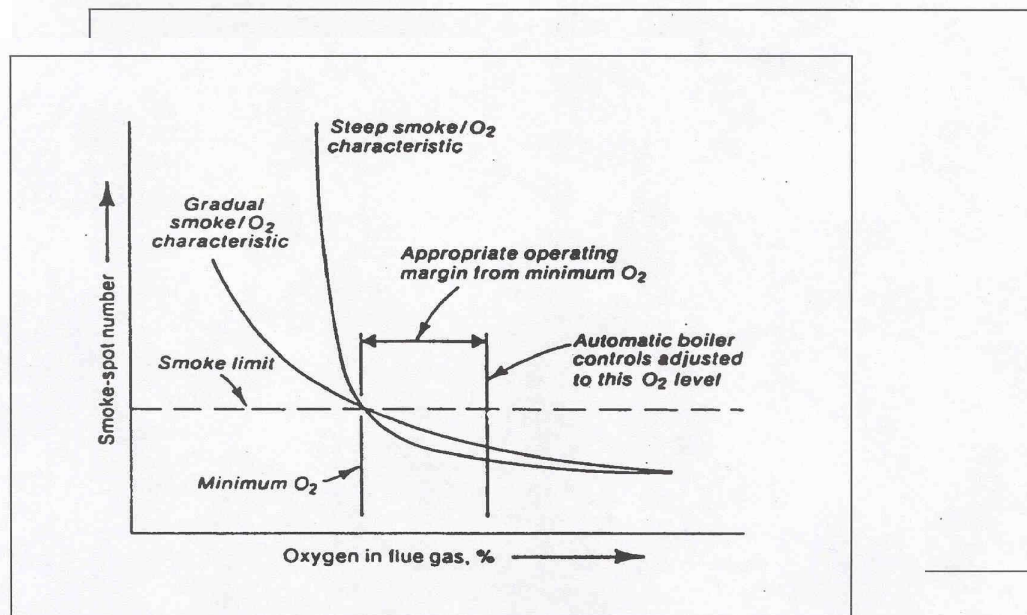


Figure 2 Oxygen/Smoke Characteristic Curve

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

<u>Fuel</u>	<u>Measurement</u>	<u>Value</u>
Gaseous	CO Emissions	400 ppm
#1 and #2 oils	smoke-spot number	number 1
#4 oil	smoke-spot number	number 2
#5 oil	smoke-spot number	number 3
Other oils	smoke-spot number	number 4

The above conditions are referred to as the CO or smoke thresholds, or as the minimum excess oxygen level.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent O₂ to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.
9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.
10. Verify that the new settings can accommodate the sudden load changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

sure that the final control settings are recorded at steady-state operating conditions for future reference.

11. When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or heater records indicating name and signature of person, title, and date the tuneup was performed.

B. Equipment Tuning Procedure for Natural Draft-Fired Boilers, Steam Generators, and Process Heaters.

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant codes, regulations, and equipment manufacturers specifications and operating manuals.

Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)****1. PRELIMINARY ANALYSIS****a. CHECK THE OPERATING PRESSURE OR TEMPERATURE.**

Operate the boiler, steam generator, or heater at the lowest acceptable pressure or temperature that will satisfy the load demand. This will minimize heat and radiation losses. Determine the pressure or temperature that will be used as a basis for comparative combustion analysis before and after tuneup.

b. CHECK OPERATING HOURS.

Plan the workload so that the boiler, steam generator, or process heater operates only the minimum hours and days necessary to perform the work required. Fewer operating hours will reduce fuel use and emissions. For units requiring a tuneup to comply with the rule, a totalizing non-resettable fuel meter will be required for each fuel used and for each boiler, steam generator, and heater to prove fuel consumption is less than the heat input limit in therms per year specified in the rule.

c. CHECK AIR SUPPLY.

Sufficient fresh air supply is essential to ensure optimum combustion and the area of air supply openings must be in compliance with applicable codes and regulations. Air openings must be kept wide open when the burner is firing and clear from restriction to flow.

d. CHECK VENT.

Proper venting is essential to assure efficient combustion. Insufficient draft or overdraft promotes hazards and inefficient burning. Check to be sure that vent is in good condition, sized properly and with no obstructions.

e. COMBUSTION ANALYSIS.

Perform an "as is" combustion analysis (CO, O₂, etc.) with a warmed up unit at high and low fire, if possible. In addition to data obtained from combustion analysis, also record the following:

i. Inlet fuel pressure at burner (at high & low fire)

ii. Draft at inlet to draft hood or barometric damper

1) Draft hood: high, medium, and low

2) Barometric Damper: high, medium, and low

iii. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the boiler, steam generator, or process heater.

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

- iv. Unit rate if meter is available.

With above conditions recorded, make the following checks and corrective actions as necessary:

2. CHECKS & CORRECTIONS**a. CHECK BURNER CONDITION.**

Dirty burners or burner orifices will cause boiler, steam generator, or process heater output rate and thermal efficiency to decrease. Clean burners and burner orifices thoroughly. Also, ensure that fuel filters and moisture traps are in place, clean, and operating properly, to prevent plugging of gas orifices. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Look for any burned-off or missing burner parts, and replace as needed.

b. CHECK FOR CLEAN BOILER, STEAM GENERATOR, OR PROCESS HEATER TUBES & HEAT TRANSFER SURFACES.

External and internal build-up of sediment and scale on the heating surfaces creates an insulating effect that quickly reduces unit efficiency. Excessive fuel cost will result if the unit is not kept clean. Clean tube surfaces, remove scale and soot, assure proper process fluid flow and flue gas flow.

c. CHECK WATER TREATMENT & BLOWDOWN PROGRAM.

Soft water and the proper water or process fluid treatment must be uniformly used to minimize scale and corrosion. Timely flushing and periodic blowdown must be employed to eliminate sediment and scale build-up on a boiler, steam generator or process heater.

d. CHECK FOR STEAM, HOT WATER OR PROCESS FLUID LEAKS

Repair all leaks immediately since even small high-pressure leaks quickly lead to considerable fuel, water and steam losses. Be sure there are no leaks through the blow-off, drains, safety valve, by-pass lines or at the feed pump, if used.

3. SAFETY CHECKS**a. Test primary and secondary low water level controls.****b. Check operating and limit pressure and temperature controls.****c. Check pilot safety shut off operation.****d. Check safety valve pressure and capacity to meet boiler, steam generator or process heater requirements.****PAR 1146.1-18**

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

- e. Check limit safety control and spill switch.

4. ADJUSTMENTS

While taking combustion readings with a warmed up boiler, steam generator, or process heater at high fire perform checks and adjustments as follows:

- a. Adjust unit to fire at rate; record fuel manifold pressure.
- b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at both high, medium and low fire. Carbon Monoxide (CO) value should always be below 400 parts per million (PPM) at 3% O₂. If CO is high make necessary adjustments.

Check to ensure boiler, steam generator, or process heater light offs are smooth and safe. A reduced fuel pressure test at both high and low fire should be conducted in accordance with the manufacturers instructions and maintenance manuals.

- c. Check and adjust operation of modulation controller. Ensure proper, efficient and clean combustion through range of firing rates.

When above adjustments and corrections have been made, record all data.

5. FINAL TEST

Perform a final combustion analysis with a warmed up boiler, steam generator, or process heater at high, medium and low fire, whenever possible. In addition to data from combustion analysis, also check and record:

- a. Fuel pressure at burner (High, Medium, and Low).
- b. Draft above draft hood or barometric damper (High, Medium and Low).
- c. Steam pressure or water temperature entering and leaving boiler, steam generator, or process heater.
- d. Unit rate if meter is available.

When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or process heater records indicating name and signature of person, title, company name, company address and date the tuneup was performed.

- (32) For dual fuel co-fired combustion units a weighted average limit calculated by Equation 1146.1-1 may be used provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(67), for units burning a combination of both fuels.

$$\text{Weighted Limit} = \frac{(CL_A \times Q_A) + (CL_B \times Q_B)}{Q_A + Q_B} \quad \text{Equation 1146.1-1}$$

Where:

CL_A = compliance limit for fuel A

CL_B = compliance limit for fuel B

Q_A = heat input from fuel A

Q_B = heat input from fuel B

- (43) The owner or operator of any unit(s) with a heat input capacity greater than 2 million Btu per hour shall not discharge into the atmosphere carbon monoxide (CO) emissions in excess of 400 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) or for natural gas fired units 0.30 lbs/10⁶ Btu.
- (54) In lieu of complying with the applicable emission limits specified in paragraph (c)(1), (c)(2), (c)(3), (e)(1), and (e)(2)(e)(4) any unit(s) subject to subdivision (a) in operation prior to September 5, 2008 for non-RECLAIM facilities, or in operation prior to [12 months after date of amendment] for RECLAIM or former RECLAIM facilities, and with an annual heat input of less than or equal to 18,000 therms per calendar year, shall:
- (A) be operated in a manner that maintains stack-gas oxygen concentrations at less than or equal to 3 percent on a dry basis for any 15-consecutive-minute averaging period; or
 - (B) be tuned at least twice per year, (at intervals from four to eight months apart) in accordance with the procedure described in Attachment 1 or the unit manufacturer's specified tune-up procedure. If a different tune-up procedure from that described in attachment 1 is used then a copy of this procedure shall be kept on site. The owner or operator of any unit(s) selecting the tune-up option shall maintain records for a rolling of twenty four month period verifying that the required tune-ups have been performed. If

the unit does not operate throughout a continuous six-month period within 12 month period, only one tune-up is required for the twelve month period that includes the entire period of non-operation. For this case, the tune-up shall be conducted within 30 days of start-up. No tune-up is required during a rolling twelve month period for any unit that is not operated during that rolling 12 month period; this unit may be test fired to verify availability of the unit for its intended use but once test firing is completed it shall be shutdown. Records of test firings shall be maintained for a rolling twenty four month period, and shall be made accessible upon request from an authorized District representative upon request.

(65) Notwithstanding paragraph (c)(1), Aan owner or operator of a non-RECLAIM facility that has installed or modified the following units prior to [date of amendment] shall meet the NOx emission limit specified in Table 1146.1-1 by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier: a natural gas fired unit prior to September 5, 2008 complying with the applicable BACT emission limit of 12 ppm or less of NOx may defer compliance with paragraph (c)(2) until the unit's burner(s) replacement.

(A) Natural gas fired units subject to subparagraph (c)(1)(E) or (c)(1)(F) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or

(B) Thermal fluid heaters subject to subparagraph (c)(1)(G) with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate.

(76) Any owner or operator who chooses the pound per million Btu of heat input compliance option in paragraph (c)(1) or (c)(3), (e)(2), or (e)(4) for natural gas fired units or chooses the weighted average emission limit using Equation 1146.1-1 under paragraph (c)(32) shall install a non-resettable, totalizing fuel meter for each fuel used on an individual unit basis, as approved by the Executive Officer.

(87) ~~On or after January 1, 2015, a~~An owner or operator of any landfill or digester gas (biogas) unit co-fired with natural gas shall not operate the unit in a manner that exceeds the applicable landfill or digester gas emission concentration limits specified in paragraph (c)(21), provided that the facility

monthly average biogas usage by the biogas units is 90% or more, based on the higher heating value of the fuels used.

(A) The Executive Officer may approve the burning of more than 10% up to:

- (i) 25% natural gas in a biogas fired unit at the 15 ppm (digester gas) or 25 ppm (landfill gas) NOx level, when it is necessary, if the only alternative to limiting natural gas to 10% would be shutting down the unit and flaring more biogas.
- (ii) 50% natural gas in a digester gas-fired unit at the 15 ppm NOx level, when it is necessary as specified in clause (c) (87)(A)(i) and for units installed on or after September 5, 2008 provided the unit has demonstrated compliance with the NOx limits in paragraph (c)(21) applicable to units fired exclusively on natural gas.

For units subject to this subparagraph, the percent natural gas usage shall be based on the facility monthly average biogas usage by the biogas units and the higher heating value of the fuels used.

(B) Any biogas-fired unit burning more than the approved percent natural gas as determined under subparagraph (c)(87)(A) shall comply with the weighted average NOx limit specified in paragraph (c)(32).

(d) Compliance Determination

- (1) Owners or operators of any units shall have the option of complying with either the pound per million Btu of heat input or parts per million emission limits specified in paragraph (c)(1), (c)(2), or (c)(3), ~~or~~ (c)(4).
- (2) All emission determinations shall be made in the as-found operating condition, except no compliance determination shall be established during unit start-up, shutdown, or under breakdown conditions. Start-up or shutdown intervals shall not last longer than is necessary to reach stable temperatures. In no case shall the start-up or shutdown interval last longer than six hours or the time specified in the permit to operate, whichever is less. Start-ups and shutdowns shall not last longer than is necessary to reach stable conditions. A compliance determination as specified in paragraph (d)(65) shall be conducted at least 250 operating hours, or at least thirty days

subsequent to the tuning or servicing of any unit, unless it is an unscheduled repair.

~~(3) All parts per million emission limits specified in subdivision (c) are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.~~

(43) Compliance with the NO_x and CO emission requirements of paragraphs (c)(1) through (c)(43) and the stack-gas oxygen concentration requirement of subparagraph (c)(54)(A) shall be determined using a District approved contractor under the Laboratory Approval Program according to the following procedures:

- (A) District Source Test Method 100.1 - Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989); or
- (B) District Source Test Method 7.1 - Determination of Nitrogen Oxide Emissions from Stationary Sources (March 1989) and Method 10.1 - Carbon Monoxide and Carbon Dioxide by Gas Chromatograph/Non-Dispersive Infrared Detector (GC/NDIR) - Oxygen by Gas Chromatograph-Thermal Conductivity (GC/TCD) (March 1989); or
- (C) United States Environmental Protection Agency Conditional Test Method CTM-030, Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers and Process Heaters Using Portable Analyzers; or
- (D) ASTM D6522-00(2005) Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers
- (E) any other test method determined to be alternative and approved before the test in writing by the Executive Officers of the District and the California Air Resources Board and the Regional Administrator of the United States Environmental Protection Agency, Region IX.

Records of all source tests shall be maintained for a period of two years (five years for Title V facilities) and shall be made available to District personnel upon request. Emissions determined to exceed any limits

established by this rule through the use of any of the above-referenced test methods shall constitute a violation of this rule.

- (54) For any owner or operator who chooses the pounds-of per million Btu of heat input compliance option of paragraph (c)(1), (c)(2), or (c)(43) for natural gas fired units, NOx emissions in pounds per million Btu of heat input shall be calculated using the procedures in 40 CFR Part 60, Appendix A, Method 19, Sections 2 and 3 and CO emissions in pounds per million Btu of heat input shall be calculated according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1.
- (65) Compliance determination with the NOx emission requirements specified in paragraph (d)(43) shall be conducted once every five years.
- (76) Any owner or operator of units subject to this rule shall perform diagnostic emission checks of NOx emissions with a portable NOx, CO and oxygen analyzer according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1 according to the following schedule:
- (A) ~~On or after July 1, 2009, t~~The owner or operator of units subject to paragraphs (c)(1), (c)(2), or through (c)(43) shall check NOx emissions at least quarterly or every 2,000 unit operating hours, whichever occurs later. If a unit is in compliance for four consecutive required diagnostic emission checks, without any adjustments to the oxygen sensor set points, then the unit may be checked semi-annually or every 4,000 unit operating hours, whichever occurs later, until the diagnostic emission check exceeds the applicable limit specified in paragraphs (c)(1), or (c)(2), or ~~(c)(3).~~
- (B) On or after ~~January 1, 2015~~ [15 years after the date of amendment] or ~~during burner replacement when 50 percent or more of the unit's burners are replaced, whichever occurs later~~ is earlier, units ~~subject to complying with the requirements specified in paragraph (c)(54)~~ shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(54)(B).

- (C) Records of all monitoring data required under subparagraphs (d)(76)(A) and (d)(76)(B) shall be maintained for a rolling twelve month period of two years (five years for Title V facilities) and shall be made available to District personnel upon request.
- (D) The portable analyzer diagnostic emission checks required under subparagraphs (d)(76)(A) and (d)(76)(B) shall only be conducted by a person who has completed an appropriate District-approved training program in the operation of portable analyzers and has received a certification issued by the District.
- (87) An owner or operator shall comply with the requirements as applied to CO emissions specified in paragraphs (d)(65) and (d)(76).
- (98) A diagnostic emission check conducted under the requirements specified in paragraph (d)(76) that finds emissions in excess of those allowed by this rule or a permit condition shall not constitute a violation of this rule if the owner or operator corrects the problem and demonstrate compliance with another emission check within 72 hours from the time the owner or operator knew of excess emissions, or reasonably should have known, or shut down the unit by the end of an operating cycle, whichever is sooner.
- (109) Notwithstanding the requirements specified in paragraph (d)(98) any diagnostic emission check conducted by District staff that finds emissions in excess of those allowed by this rule or a permit condition is a violation.
- (110) An owner or operator may opt to lower the unit's rated heat input capacity. The lowered rated heat input capacity shall not be less than or equal to 2 million Btu per hour and shall be based on manufacturer's identification or rating plate or permit condition.
- (e) Compliance Schedule
 - ~~(1) Owners or operators of units shall comply with the applicable schedule specified in paragraphs (c)(1) and (c)(2).~~
 - (1) The owner or operator of a RECLAIM or former RECLAIM facility with any unit(s) subject to paragraph (c)(1) shall meet the applicable NOx emission limit in Table 1146.1-1 in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities.
 - (2) An owner or operator of a non-RECLAIM facility with any thermal fluid heaters with a NOx emission limit greater than 20 ppm shall:

- (A) On or before [12 months after date of amendment], submit a complete permit application for each thermal fluid heater that does not currently meet the limit specified in subparagraph (c)(1)(G); and
 - (B) On or before January 1, 2022, meet the applicable NOx emission limit in Table 1146.1-1 for thermal fluid heaters subject to subparagraph (c)(1)(G).
- (23) On or after January 1, 2015 [15 years after the date of amendment] or during burner replacement when 50 percent or more of the unit's burners are replaced, whichever is later, no person shall operate in the District any unit subject to complying with paragraph (c)(54) which that discharges into the atmosphere NOx emission in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) does not meet the emissions limits specified in paragraph (c)(1).
- (34) If any unit subject to complying with paragraph (c)(54) that exceeds 18,000 therms of annual heat input from all fuels used in any twelve month period, the owners or operators shall:
 - (A) within 4 months after exceeding 18,000 therms of heat input in any twelve month period, submit required applications for permits to construct and operate; and
 - (B) within 18 months after exceeding 18,000 therms of heat input in any twelve month period, demonstrate and maintain compliance with all applicable requirements specified in paragraphs (c)(1) through (c)(43) for the life of the unit.
- (45) The Executive Officer shall grant a time extension to the full compliance date with the applicable NOx compliance limits for any natural gas fired units specified in paragraph (c)(21) for any health facility as defined in Section 1250 of the California Health and Safety Code that can demonstrate that the Office of Statewide Health Planning and Development has approved an extension of time to comply with seismic safety requirements pursuant to Health and Safety Code Sections 130060 and 130061.5. The extension of time granted by the Executive Officer shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130060 but not to exceed January 1, 2015 and shall be consistent with the time extension granted pursuant to Health and Safety Code Section

130061.5 but not to exceed January 1, 2020. Those health facilities granted a time extension shall submit a compliance plan to the Executive Officer on or before January 1, 2010.

(f) Exemptions

The provisions of this rule shall not apply to any unit at a RECLAIM or former RECLAIM facility that is subject to a NO_x emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NO_x Facilities.

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)****ATTACHMENT 1****A. Equipment Tuning Procedure¹ for Forced-Draft Boilers, Steam Generators, and Process Heaters**

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number² (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values³, and if CO emissions are low and there is not smoke, the unit is probably operating at near optimum efficiency - at this particular firing rate.
3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the stack gas temperature, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.

However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

¹This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the United States EPA.

²The smoke-spot number can be determined with ASTM Test Method D-2156 or with the Bacharach method. ASTM Test Method D-2156 is included in a tuneup kit that can be purchased from the Bacharach Company.

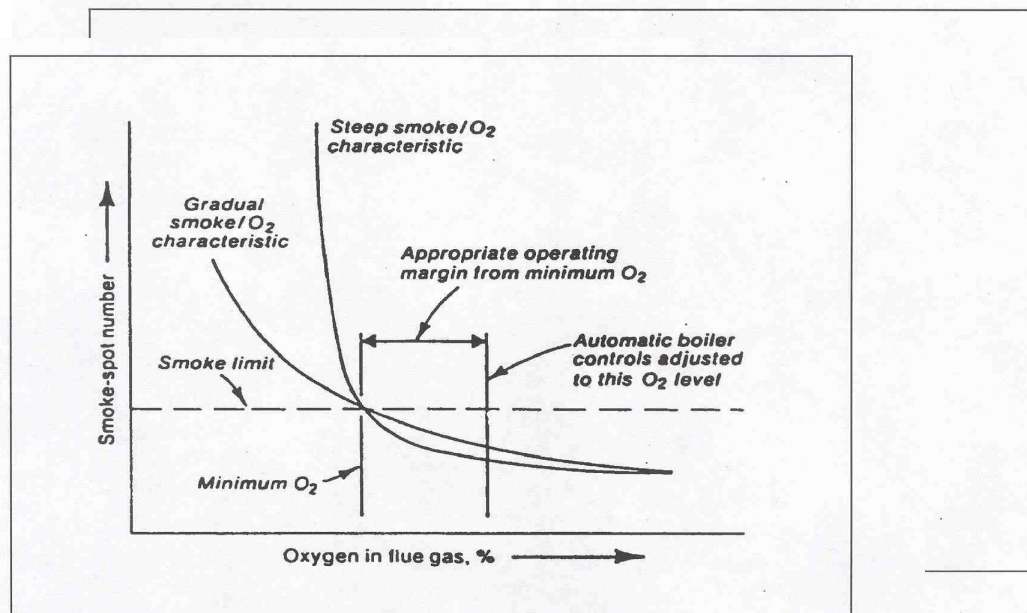
³Typical minimum oxygen levels for boilers at high firing rates are:

1. For natural gas: 0.5% - 3%
2. For liquid fuels: 2% - 4%

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.
5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
 - a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
 - b. Stack gas CO concentrations greater than 400 ppm.
 - c. Smoking at the stack.
 - d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.
6. Develop an O₂/CO curve (for gaseous fuels) or O₂/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.

**Figure 2 Oxygen/Smoke Characteristic Curve****PAR 1146.1-14**

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

<u>Fuel</u>	<u>Measurement</u>	<u>Value</u>
Gaseous	CO Emissions	400 ppm
#1 and #2 oils	smoke-spot number	number 1
#4 oil	smoke-spot number	number 2
#5 oil	smoke-spot number	number 3
Other oils	smoke-spot number	number 4

The above conditions are referred to as the CO or smoke thresholds, or as the minimum excess oxygen level.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent O₂ to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.
9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.
10. Verify that the new settings can accommodate the sudden load changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

sure that the final control settings are recorded at steady-state operating conditions for future reference.

11. When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or heater records indicating name and signature of person, title, and date the tuneup was performed.

B. Equipment Tuning Procedure for Natural Draft-Fired Boilers, Steam Generators, and Process Heaters.

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant codes, regulations, and equipment manufacturers specifications and operating manuals.

Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)****1. PRELIMINARY ANALYSIS****a. CHECK THE OPERATING PRESSURE OR TEMPERATURE.**

Operate the boiler, steam generator, or heater at the lowest acceptable pressure or temperature that will satisfy the load demand. This will minimize heat and radiation losses. Determine the pressure or temperature that will be used as a basis for comparative combustion analysis before and after tuneup.

b. CHECK OPERATING HOURS.

Plan the workload so that the boiler, steam generator, or process heater operates only the minimum hours and days necessary to perform the work required. Fewer operating hours will reduce fuel use and emissions. For units requiring a tuneup to comply with the rule, a totalizing non-resettable fuel meter will be required for each fuel used and for each boiler, steam generator, and heater to prove fuel consumption is less than the heat input limit in therms per year specified in the rule.

c. CHECK AIR SUPPLY.

Sufficient fresh air supply is essential to ensure optimum combustion and the area of air supply openings must be in compliance with applicable codes and regulations. Air openings must be kept wide open when the burner is firing and clear from restriction to flow.

d. CHECK VENT.

Proper venting is essential to assure efficient combustion. Insufficient draft or overdraft promotes hazards and inefficient burning. Check to be sure that vent is in good condition, sized properly and with no obstructions.

e. COMBUSTION ANALYSIS.

Perform an "as is" combustion analysis (CO, O₂, etc.) with a warmed up unit at high and low fire, if possible. In addition to data obtained from combustion analysis, also record the following:

i. Inlet fuel pressure at burner (at high & low fire)

ii. Draft at inlet to draft hood or barometric damper

1) Draft hood: high, medium, and low

2) Barometric Damper: high, medium, and low

iii. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the boiler, steam generator, or process heater.

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Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

- iv. Unit rate if meter is available.

With above conditions recorded, make the following checks and corrective actions as necessary:

2. CHECKS & CORRECTIONS**a. CHECK BURNER CONDITION.**

Dirty burners or burner orifices will cause boiler, steam generator, or process heater output rate and thermal efficiency to decrease. Clean burners and burner orifices thoroughly. Also, ensure that fuel filters and moisture traps are in place, clean, and operating properly, to prevent plugging of gas orifices. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Look for any burned-off or missing burner parts, and replace as needed.

b. CHECK FOR CLEAN BOILER, STEAM GENERATOR, OR PROCESS HEATER TUBES & HEAT TRANSFER SURFACES.

External and internal build-up of sediment and scale on the heating surfaces creates an insulating effect that quickly reduces unit efficiency. Excessive fuel cost will result if the unit is not kept clean. Clean tube surfaces, remove scale and soot, assure proper process fluid flow and flue gas flow.

c. CHECK WATER TREATMENT & BLOWDOWN PROGRAM.

Soft water and the proper water or process fluid treatment must be uniformly used to minimize scale and corrosion. Timely flushing and periodic blowdown must be employed to eliminate sediment and scale build-up on a boiler, steam generator or process heater.

d. CHECK FOR STEAM, HOT WATER OR PROCESS FLUID LEAKS

Repair all leaks immediately since even small high-pressure leaks quickly lead to considerable fuel, water and steam losses. Be sure there are no leaks through the blow-off, drains, safety valve, by-pass lines or at the feed pump, if used.

3. SAFETY CHECKS**a. Test primary and secondary low water level controls.****b. Check operating and limit pressure and temperature controls.****c. Check pilot safety shut off operation.****d. Check safety valve pressure and capacity to meet boiler, steam generator or process heater requirements.****PAR 1146.1-18**

Amended Rule 1146.1 (Cont.)**(Amended May 13, 1994)**

- e. Check limit safety control and spill switch.

4. ADJUSTMENTS

While taking combustion readings with a warmed up boiler, steam generator, or process heater at high fire perform checks and adjustments as follows:

- a. Adjust unit to fire at rate; record fuel manifold pressure.
- b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at both high, medium and low fire. Carbon Monoxide (CO) value should always be below 400 parts per million (PPM) at 3% O₂. If CO is high make necessary adjustments.

Check to ensure boiler, steam generator, or process heater light offs are smooth and safe. A reduced fuel pressure test at both high and low fire should be conducted in accordance with the manufacturers instructions and maintenance manuals.

- c. Check and adjust operation of modulation controller. Ensure proper, efficient and clean combustion through range of firing rates.

When above adjustments and corrections have been made, record all data.

5. FINAL TEST

Perform a final combustion analysis with a warmed up boiler, steam generator, or process heater at high, medium and low fire, whenever possible. In addition to data from combustion analysis, also check and record:

- a. Fuel pressure at burner (High, Medium, and Low).
- b. Draft above draft hood or barometric damper (High, Medium and Low).
- c. Steam pressure or water temperature entering and leaving boiler, steam generator, or process heater.
- d. Unit rate if meter is available.

When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or process heater records indicating name and signature of person, title, company name, company address and date the tuneup was performed.

APPENDIX A-3

Proposed Amended Rule 1146.2

(Adopted January 9, 1998)-(Amended January 7, 2005)-(Amended May 5, 2006)
(PAR September 18, 2018)

RULE 1146.2. EMISSIONS OF OXIDES OF NITROGEN FROM LARGE WATER HEATERS AND SMALL BOILERS AND PROCESS HEATERS

(a) Purpose and Applicability

The purpose of this rule is to reduce NOx emissions from natural gas-fired water heaters, boilers, and process heaters as defined in this rule. This rule applies to units that have a rated heat input capacity less than or equal to 2,000,000 Btu per hour. Type 1 Units as defined in this rule are typically, but not exclusively, large water heaters or smaller-sized process heaters in the above range. Type 2 Units as defined in this rule are typically, but not exclusively, small boilers or larger-sized process heaters in this range. Beginning, January 1, 2000, the provisions of this rule are applicable to manufacturers, distributors, retailers, refurbishers, installers and operators of new units. Beginning, July 1, 2002, the provisions of this rule are also applicable to operators of existing Type 2 Units.

(b) Definitions

- (1) BEST AVAILABLE RETROFIT CONTROL TECHNOLOGY (BARCT) as defined in the California Health and Safety Code Section 40406.
- (42) BOILER OR STEAM GENERATOR means any equipment that is fired with or is designed to be fired with natural gas, used to produce steam or to heat water, and that is not used exclusively to produce electricity for sale. Boiler or Steam Generator does not include any waste heat recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment.
- (23) BTU means British thermal unit or units.
- (34) CERTIFIED RETROFIT KIT means any burner and ancillary controls or blowers that have been demonstrated to comply with the provisions of this rule, on a retrofit basis, on a particular model of unit.
- (45) FIRE TUBE BOILER means a BOILER in which hot gases from the combustion chamber pass through one or more tubes within the boiler.
- (6) FORMER RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018 , as established in

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Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.

- (57) HEAT INPUT means the higher heating value of the fuel to the unit measured as BTU per hour.
- (68) HEAT OUTPUT means the enthalpy of the working fluid output of the unit.
- (79) INDEPENDENT TESTING LABORATORY means a testing laboratory that meets the requirements of District Rule 304, subdivision (k) and is approved by the District to conduct certification testing under the Protocol.
- (810) INSTANTANEOUS WATER HEATER means a WATER HEATER with a rated heat input capacity less than or equal to 2,000,000 Btu per hour that heats water only when it flows through a heat exchanger.
- (911) NOx EMISSIONS means the sum of nitrogen oxide and nitrogen dioxide in the flue gas, collectively expressed as nitrogen dioxide.
- (1012) POOL HEATER means a WATER HEATER designed to heat a pool, hot tub or spa.
- (1113) PROCESS HEATER means any equipment that is fired with or is designed to be fired with natural gas and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven used for annealing, 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.
- (1214) PROTOCOL means South Coast Air Quality Management District Protocol: Nitrogen Oxides Emissions Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers.
- (15) RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.
- (1316) RATED HEAT INPUT CAPACITY means the gross heat input of the combustion device, as supported by required documentation and which shall be specified on a permanent rating plate.
- (1417) RECREATIONAL VEHICLE means any vehicle used for recreational purposes designed to include a water heater and licensed to be driven or moved on the highways of California.
- (1518) REFURBISHER means anyone who reconditions a Type 1 Unit or Type 2 Unit and offers the unit for resale, for use in the District.
- (1619) RESELLER means anyone who sells either retail, wholesale or on an individual basis Type 1 Units or Type 2 Units.

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- (1720) RESIDENTIAL means any structure which is designed for and used exclusively as a dwelling for not more than four families, and where such equipment is used by the owner or occupant of such a dwelling.
- (1821) TANK TYPE WATER HEATER means a WATER HEATER with a rated heat input capacity from 75,000 Btu per hour to 2,000,000 Btu per hour and with an integral closed vessel in which water is heated and stored for use external to the vessel.
- (1922) THERM means 100,000 BTU.
- (2023) THERMAL FLUID HEATER means a PROCESS HEATER in which a process is heated indirectly by a heated fluid other than water.
- (2124) TYPE 1 UNIT means any water heater, boiler or process heater with a RATED HEAT INPUT CAPACITY less than or equal to 400,000 BTU per hour excluding TANK TYPE WATER HEATERS subject to the limits of District Rule 1121.
- (2225) TYPE 2 UNIT means any water heater, boiler or process heater with a RATED HEAT INPUT CAPACITY greater than 400,000 BTU per hour up to and including 2,000,000 BTU per hour.
- (2326) UNIT means any boiler, steam generator, water heater or process heater as defined in paragraph (b)(12), (b)(34), (b)(45), (b)(810), (b)(1012), (b)(1113), (b)(1821), (b)(2023), (b)(2124), (b)(2225) or (b)(2427).
- (2427) WATER HEATER means any equipment that is fired with or designed to be fired with natural gas and that is used solely to heat water for use external to the equipment.

(c) Requirements

- (1) On or after January 1, 2000, no person shall manufacture for use, or offer for sale for use, in the District any new Type 2 Unit, unless the NOx emissions level is less than or equal to 30 ppm of NOx emissions (at 3% O₂, dry) or 0.037 pound NOx per million Btu of heat input and no more than 400 ppm of carbon monoxide (at 3% O₂, dry), as certified by the District according to subdivision (d).
- (2) On or after January 1, 2001, no person shall manufacture for use, or offer for sale for use, in the District any new Type 1 Unit, unless the NOx emissions level is less than or equal to 40 nanograms of NOx (calculated as NO₂) per joule (93 lb per billion Btu) of heat output or 55 ppm NOx

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emissions (at 3% O₂, dry), as certified by the District according to subdivision (d).

- (3) Except for units at a RECLAIM or former RECLAIM facility, On or after July 1, 2002, no person shall operate in the District any unit with a rated heat input capacity greater than 1,000,000 Btu per hour but less than or equal to 2,000,000 Btu per hour manufactured prior to January 1, 1992, which does not meet the emissions limits required by paragraph (c)(1). Alternatively, a unit may be modified or demonstrated to meet the emission limits of paragraph (c)(1) pursuant to the provisions of subdivision (e).
- (4) Except for units at a RECLAIM or former RECLAIM facility, On-on or after January 1, 2006, no person shall operate in the District any unit more than 15 years old, based on the original date of manufacture as specified in paragraph (c)(6), with a rated heat input capacity greater than 1,000,000 Btu per hour but less than or equal to 2,000,000 Btu per hour and manufactured on or after January 1, 1992, which does not meet the emissions limits required by paragraph (c)(1). Alternatively, a unit may be modified or demonstrated to meet the emission limits of paragraph (c)(1) pursuant to the provisions of subdivision (e).
- (5) Except for units at a RECLAIM or former RECLAIM facility, On-on or after January 1, 2006, no person shall operate in the District any unit more than 15 years old, based on the original date of manufacture as specified in paragraph (c)(6), with a rated heat input capacity greater than 400,000 Btu per hour but less than or equal to 1,000,000 Btu per hour manufactured prior to January 1, 2000, which does not meet the emissions limits required by paragraph (c)(1). Alternatively, a unit may be modified or demonstrated to meet the emission limits of paragraph (c)(1) pursuant to the provisions of subdivision (e).
- (6) The original date of manufacture shall be determined by:
 - (A) Original manufacturer's identification or rating plate permanently fixed to the equipment. If not available, then;
 - (B) Invoice from manufacturer for purchase of equipment. If not available, then:
 - (C) Unit is deemed to be more than 15 years old.
- (7) On or after January 1, 2010, no person shall manufacture for use or offer for sale for use within the District any Type 2 unit unless the unit is certified pursuant to subdivision (d) to a NO_x emission level of less than 14

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nanograms of NO_x (calculated as NO₂) per joule of heat output or less than or equal to 20 ppm of NO_x emissions (at 3% O₂, dry).

- (8) On or after January 1, 2012, no person shall manufacture for use or offer for sale for use within the District any Type 1 unit (excluding pool heaters), unless the unit is certified pursuant to subdivision (d) to a NO_x emission level of less than 14 nanograms of NO_x (calculated as NO₂) per joule of heat output or less than or equal to 20 ppm of NO_x emissions (at 3% O₂, dry).
- (9) Notwithstanding the exemptions contained in Rule 2001(j) and its accompanying Table 1, ~~On~~ on or after May 5, 2006, the owner or operator of any Type 2 unit shall perform maintenance in accordance with the manufacturer's schedule and specifications as identified in a manual and other written materials supplied by the manufacturer or distributor. The owner or operator shall maintain on site a copy of the manufacturer's and/or distributor's written instructions and retain a record of the maintenance activity for a period of not less than three years.
- (10) Notwithstanding the exemptions contained in Rule 2001(j) and its accompanying Table 1, ~~T~~the owner or operator shall maintain on site a copy of all documents identifying the unit's rated heat input capacity. The rated heat input capacity shall be identified by a manufacturer's or distributor's manual or invoice. If a unit is modified, the rated heat input capacity shall be calculated pursuant to paragraph (f)(3). The documentation of rated heat input capacity for modified units shall include a description of all modifications, the dates the unit was modified and calculation of rated heat input capacity. All documentation shall be signed by the licensed person modifying the unit.
- (11) Notwithstanding the requirements in paragraph (c)(7), until December 31, 2010, any person may sell, offer for sale, or install any Type 2 units that are manufactured and purchased prior to January 1, 2010 and in compliance with paragraph (c)(1).
- (12) Notwithstanding the requirements in paragraph (c)(8), until December 31, 2012, any person may sell, offer for sale, or install any Type 1 units that are manufactured and purchased prior to January 1, 2012 and in compliance with paragraph (c)(2).

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(13) By January 1, 2022, the Executive Officer shall conduct a technology assessment and report to the Governing Board if the NOx emission limits in subdivision (c) represent BARCT.

(A) If the Executive Officer determines that the NOx emission limits specified in paragraph (c)(1) represents BARCT, notwithstanding the exemptions contained in Rule 2001(j) and its accompanying Table 1, the owner or operator of a RECLAIM or former RECLAIM facility with any Type 2 Units shall meet the NOx emission limit specified in paragraph (c)(1) by December 31, 2023. A Type 2 unit may be modified or demonstrated to meet the emission limit of paragraph (c)(1), pursuant to the provisions of subdivision (e). Alternatively, a Type 2 unit may be replaced with a certified unit in compliance with the provisions of paragraph (c)(7).

(B) If the technology assessment specified in this paragraph demonstrates that more stringent BARCT requirements are applicable, the Executive Officer shall initiate rule development for the implementation schedule of the more stringent BARCT requirements within six months after the technology assessment.

(d) Certification

(1) The manufacturer shall obtain confirmation from an independent testing laboratory prior to applying for certification that, each unit model or retrofit kit complies with the applicable requirements of subdivision (c). This confirmation shall be based upon emission tests of a randomly selected unit of each model, and the Protocol shall be adhered to during the confirmation testing of all units subject to this rule.

(2) When applying for unit(s) certification, the manufacturer shall submit to the Executive Officer the following:

(A) A statement that the model is in compliance with subdivision (c). The statement shall be signed and dated, and shall attest to the accuracy of all statements;

(B) General Information

(i) Name and address of manufacturer,

(ii) Brand name, and

(iii) Model number, as it appears on the unit rating plate;

(C) A description of each model being certified; and

Rule 1146.2 (Cont.)**(May 5, 2006)(PAR September 18, 2018)**

- (D) A source test report verifying compliance with the emission limits in subdivision (c) for each model to be certified. The source test report shall be prepared by the confirming independent testing laboratory and shall contain all of the elements identified in Section 10 of the Protocol for each unit tested. The source test shall have been conducted no more than ninety (90) days prior to the date of submittal to the Executive Officer.
 - (3) When applying for unit certification, the manufacturer shall submit the items identified in paragraph (d)(2) no more than ninety (90) days after the date of the source test identified in subparagraph (d)(2)(D) and at least 120 days prior to the date of the proposed sale of the units.
 - (4) The Executive Officer shall certify a unit model which complies with the provisions of subdivision (c) and of paragraphs (d)(1), (d)(2), and (d)(3).
 - (5) Certification status shall be valid for three years from the date of approval by the Executive Officer. After the third year, recertification may be required according to the requirements of paragraphs (d)(1) and (d)(2).
- (e) Modification (Retrofit) Provisions and Demonstration of Compliance With Emission Limits.
- Any unit, may be modified or demonstrated to meet the requirements of paragraph (c)(1), (c)(2), (c)(3), (c)(4), or (c)(5) provided:
- (1) The unit is certified pursuant to subdivision (d); or
 - (2) A certified retrofit kit has been installed; or
 - (3) A copy of a source test report conducted by an independent third party, demonstrating the specific unit complies with the emission limits at low and high fire, shall be maintained on-site; and
 - (4) The source test report clearly specifies the emissions limit of the unit in parts per million or pounds of NOx per million Btu of heat input. The source test report must identify that the source test was conducted pursuant to a District approved protocol; and
 - (5) The source test report shall be maintained on-site at the facility where the unit is being operated and made available to the Executive Officer, at all times, upon request, as long as the unit is being operated. The model and serial numbers of the specified unit shall clearly be indicated on the source test report.

Rule 1146.2 (Cont.)**(May 5, 2006)(PAR September 18, 2018)****(f) Identification of Compliant Units****(1) Newly Manufactured Units**

The manufacturer shall display the model number of the unit complying with subdivision (c) on the shipping carton and permanent rating plate. The manufacturer shall also display the certification status on the shipping carton and on the unit.

(2) Certified Retrofit Kits

The manufacturer shall display the model number of the retrofit kit and manufacturer and model of applicable units on the shipping carton and in a plainly visible portion of the retrofit kit.

(3) Modified Units

A unit with a new or modified burner shall display the new rated heat input capacity and certification status on a new permanent rating plate. The gross heat input shall be based on the maximum fuel input corrected for fuel heat content, temperature and pressure.

(g) Enforcement

The Executive Officer may periodically inspect distributors, retailers, and installers of units located in the District, and conduct such tests as are deemed necessary to ensure compliance with subdivision (c).

(h) Exemptions**(1) The provisions of this rule shall not apply to:**

(A) Units used in recreational vehicles.

(B) Units subject to the limits in District Rule 1121 – Control of Nitrogen Oxides From Residential Type, Natural Gas-fired Water Heaters.

(2) The provisions of paragraphs (c)(3), (c)(4), and (c)(5) shall not apply to:

(A) Any residential unit.

(B) Units with a rated heat input capacity greater than 400,000 Btu per hour, but less than or equal to 2,000,000 Btu per hour that are demonstrated to use less than 9,000 therms during every calendar year. Compliance with the exemption limit shall be demonstrated by a calculation based on the annual fuel consumption recorded by an in line fuel meter or the annual operating hours recorded by a timer and using one of the following methods.

Rule 1146.2 (Cont.)**(May 5, 2006)(PAR September 18, 2018)**

- (i) Annual therm usage recorded by fuel meter and corrected to standard pressure; or
 - (ii) Amount of fuel (i.e., in thousand cubic feet of gas corrected to standard pressure) converted to therms using the higher heating value of the fuel; or
 - (iii) Annual therm usage calculated by multiplying the number of hours fuel is burned by the rated heat input capacity of the unit converted to therms.
- (3) The NOx emission limits of paragraphs (c)(1), (c)(2), (c)(3), (c)(4) and (c)(5) of this rule shall not apply to units located at ~~RECLAIM facilities.~~ any RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.

(i) **Progress Reports**

Any person that manufactures Type 1 units or Type 2 fire tube boilers, steam boilers producing steam pressure greater than 100 pounds per square inch or thermal fluid heaters subject to this rule shall submit to the District a report on progress towards compliance with the emission limits of paragraphs (c)(7) and (c)(8). Progress reports shall include detailed information on all burner and control technologies evaluated and emission tests. The progress reports shall be submitted to the District for the following categories of equipment by the specified date:

- (1) Type 2 fire tube boilers, steam boilers producing steam pressure greater than 100 pounds per square inch and thermal fluid heaters shall be submitted to the District by January 31, 2008.
- (2) Type 1 units shall be submitted to the District by January 31, 2010.

APPENDIX A-4

Proposed Rule 1100

(PR September 18, 2018)

RULE 1100 IMPLEMENTATION SCHEDULE FOR NO_x FACILITIES**(a) Purpose**

The purpose of this rule is to establish the implementation schedule for Regulation XX NO_x RECLAIM facilities that are transitioning to a command-and-control regulatory structure.

(b) Applicability

This rule applies to RECLAIM or FORMER RECLAIM facilities that own or operate equipment that meets the applicability provisions specified in:

- (1) Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; or
- (2) Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters.

(c) Definitions

- (1) BTU means British thermal unit or units.
- (2) FORMER RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.
- (3) HEAT INPUT means the chemical heat released due to complete combustion of an amount of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.
- (4) INDUSTRY-SPECIFIC CATEGORY means RECLAIM or FORMER RECLAIM facilities that consists of refineries or electricity generating facilities.
- (5) NO_x EMISSIONS means the sum of nitric oxides and nitrogen dioxides emitted, calculated as nitrogen dioxide.
- (6) RATED HEAT INPUT CAPACITY means the heat input capacity as specified by the permit issued by the Executive Officer, or if not specified on the permit, on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.

PR 1100

- (7) RECLAIM FACILITY means a facility that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.
 - (8) RULE 1146 UNIT means any boiler, steam generator, water heater, or process heater subject to Rule 1146 with a rated heat input capacity that is equal to or greater than 5 million Btu per hour, excluding units specified in Rule 1146 exemptions.
 - (9) RULE 1146.1 UNIT means any boiler, steam generator, or process heater subject to Rule 1146.1 with a rated heat input capacity that is greater than 2 million Btu per hour and less than 5 million Btu per hour, excluding units specified in Rule 1146.1 exemptions.
 - (10) TITLE V FACILITY means any facility that meets the criteria set forth in Rule 3001 - Applicability.
- (d) Rule 1146 and Rule 1146.1 Implementation Schedule
- (1) An owner or operator of a RECLAIM or FORMER RECLAIM facility with any Rule 1146 or Rule 1146.1 Unit shall:
 - (A) On or before [*12 months after date of adoption*], submit complete permit applications for any Rule 1146 and Rule 1146.1 Units that currently do not meet the applicable NOx concentration limit specified in paragraph (d)(3);
 - (B) On or before January 1, 2021 meet the applicable NOx concentration limit for a minimum of 75% of the cumulative total heat input capacity of all Rule 1146 and Rule 1146.1 Units at the facility; and
 - (C) On or before January 1, 2022 meet the applicable NOx concentration limit of 100% of Rule 1146 and Rule 1146.1 Units at the facility.
 - (2) An owner or operator of a RECLAIM or FORMER RECLAIM facility that elects to replace an existing Rule 1146 or Rule 1146.1 Unit with a new unit may use the heat input of the unit being replaced to meet the required percentage of the total heat input for all Rule 1146 and Rule 1146.1 Units at the facility specified under subparagraphs (d)(1)(B) and (d)(1)(C) provided the owner or operator:
 - (A) On or before [*12 months after date of adoption*], submits complete permit applications for any new Rule 1146 and Rule 1146.1 Units, as well as accepts a permit condition that identifies which unit(s) will be replaced and no longer operated when the new units are installed or after January 1, 2023, whichever is earlier; and

- (B) Replaces the existing unit on or before January 1, 2023.
- (3) The applicable NOx concentration limits specified in subparagraphs (d)(1)(B) and (d)(1)(C) are as follows:
 - (A) Rule 1146 Units shall meet the NOx concentration limit for the category of equipment specified in Rule 1146, Table 1146-1 – Standard Compliance Limits;
 - (B) Rule 1146 Units that meet the applicability provisions specified in Rule 1146 paragraph (c)(2) shall meet the ammonia emission limit specified in Rule 1146 paragraph (c)(2).
 - (C) Rule 1146.1 Units shall meet the NOx concentration limit for the category of equipment specified in Rule 1146.1, Table 1146.1-1; and
 - (D) Rule 1146.1 Units that meet the applicability provisions specified in Rule 1146.1 paragraph (c)(7) shall meet the NOx concentration limit specified in Rule 1146.1 paragraph (c)(7).
- (4) Notwithstanding paragraph (d)(1), an owner or operator of a RECLAIM or FORMER RECLAIM facility that has installed or modified the following Rule 1146 or Rule 1146.1 Units prior to *[date of adoption]* shall meet the NOx emission limit specified in paragraph (d)(3) by *[15 years after the date of adoption]* or when 50 percent or more of the unit's burners are replaced, whichever is earlier:
 - (A) Units subject to Rule 1146 subparagraph (c)(1)(F) with a NOx emission limit of 7 ppm or less as specified in a SCAQMD Permit to Operate; or
 - (B) Units subject to Rule 1146 subparagraph (c)(1)(H) or (c)(1)(I) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or
 - (C) Units subject to Rule 1146.1 subparagraph (c)(1)(E) or (c)(1)(F) with a NOx emission limit of 12 ppm or less as specified in a SCAQMD Permit to Operate; or
 - (D) Thermal fluid heaters, as defined in Rule 1146 paragraph (b)(27), subject to Rule 1146 subparagraph (c)(1)(K) with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate; or
 - (E) Thermal fluid heaters, as defined in Rule 1146.1 paragraph (b)(21), subject to Rule 1146.1 subparagraph (c)(1)(G) with a NOx emission limit of 20 ppm or less as specified in a SCAQMD Permit to Operate.

- (5) Any unit at a RECLAIM or FORMER RECLAIM facility that is subject to a NO_x emission limit in a different rule for an industry-specific category is not subject to the requirements contained in this subdivision.
- (e) The applicable monitoring, reporting, and recordkeeping requirements are as follows:
 - (1) For Title V facilities, an owner or operator of a RECLAIM facility shall comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012.
 - (2) Except for Title V facilities, the owner or operator of a RECLAIM that becomes a FORMER RECLAIM facility shall comply with the monitoring, reporting, and recordkeeping requirements in the applicable rule(s) as specified in subdivision (b) upon the date the facility becomes a FORMER RECLAIM facility.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

APPENDIX B-1

CalEEMod Files and Assumptions – Construction Emissions (SCR system)

CalEEMod Files and Assumptions – Construction Emissions

Construction of a SCR System (Annual)

PAR 1146 series SCR - South Coast AQMD Air District, Annual

PAR 1146 series SCR
South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	9			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 10 days; Site Preparation: 2 days; Building Construction: 250 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Demolition - 1 acre = 43,560 square feet

Trips and VMT - Demolition: 15 Worker Trips, 0 Vendor Trips, 5 Hauling Trips

Site Preparation: 8 Work Trips, 0 Vendor Trips, 0 Hauling Trips

Building Construction: 18 Worker Trips, 7 Vendor Trips, 0 Hauling Trips

Paving: 13 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	250.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	2.00
tblConstructionPhase	PhaseEndDate	2/21/2018	1/3/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	2/21/2018	1/10/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/16/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/20/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/4/2020

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tblConstructionPhase	PhaseStartDate	2/22/2018	1/15/2019
tblGrading	AcresOfGrading	1.00	0.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00

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tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	198.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	13.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

PAR 1146 series SCR - South Coast AQMD Air District, Annual

2.1 Overall Construction**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2650	2.0945	1.7949	3.2300e-003	0.0575	0.1102	0.1677	0.0145	0.1057	0.1202	0.0000	278.3107	278.3107	0.0508	0.0000	279.5795
2020	5.1400e-003	0.0445	0.0448	8.0000e-005	7.2000e-004	2.3300e-003	3.0500e-003	1.9000e-004	2.1900e-003	2.3800e-003	0.0000	6.6282	6.6282	1.5500e-003	0.0000	6.6669
Maximum	0.2650	2.0945	1.7949	3.2300e-003	0.0575	0.1102	0.1677	0.0145	0.1057	0.1202	0.0000	278.3107	278.3107	0.0508	0.0000	279.5795

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2650	2.0945	1.7949	3.2300e-003	0.0575	0.1102	0.1677	0.0145	0.1057	0.1202	0.0000	278.3104	278.3104	0.0508	0.0000	279.5792
2020	5.1400e-003	0.0445	0.0448	8.0000e-005	7.2000e-004	2.3300e-003	3.0500e-003	1.9000e-004	2.1900e-003	2.3800e-003	0.0000	6.6282	6.6282	1.5500e-003	0.0000	6.6669
Maximum	0.2650	2.0945	1.7949	3.2300e-003	0.0575	0.1102	0.1677	0.0145	0.1057	0.1202	0.0000	278.3104	278.3104	0.0508	0.0000	279.5792

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	11-22-2018	2-21-2019	0.3551	0.3551
5	2-22-2019	5-21-2019	0.5678	0.5678
6	5-22-2019	8-21-2019	0.5867	0.5867
7	8-22-2019	11-21-2019	0.5870	0.5870
8	11-22-2019	2-21-2020	0.2979	0.2979
		Highest	0.5870	0.5870

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

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2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail**Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/14/2019	5	10	
2	Site Preparation	Site Preparation	1/15/2019	1/16/2019	5	2	
3	Building Construction	Building Construction	1/20/2019	1/3/2020	5	250	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Paving Equipment	1	8.00	131	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Plate Compactors	1	6.00	8	0.43
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	8.00	46	0.45
Building Construction	Aerial Lifts	1	8.00	63	0.31
Demolition	Cranes	1	8.00	226	0.29
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Site Preparation	Graders	1	8.00	187	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	7	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	15.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0214	0.0000	0.0214	3.2500e-003	0.0000	3.2500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1142	0.0840	1.2000e-004		5.7200e-003	5.7200e-003		5.3500e-003	5.3500e-003	0.0000	10.6175	10.6175	2.7000e-003	0.0000	10.6849
Total	0.0111	0.1142	0.0840	1.2000e-004	0.0214	5.7200e-003	0.0272	3.2500e-003	5.3500e-003	8.6000e-003	0.0000	10.6175	10.6175	2.7000e-003	0.0000	10.6849

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3.2 Demolition - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.9000e-004	3.1300e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7645	0.7645	2.0000e-005	0.0000	0.7651
Total	3.8000e-004	1.0400e-003	3.2700e-003	1.0000e-005	8.6000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.3000e-004	0.0000	0.9551	0.9551	3.0000e-005	0.0000	0.9560

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0214	0.0000	0.0214	3.2500e-003	0.0000	3.2500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1142	0.0840	1.2000e-004		5.7200e-003	5.7200e-003		5.3500e-003	5.3500e-003	0.0000	10.6174	10.6174	2.7000e-003	0.0000	10.6849
Total	0.0111	0.1142	0.0840	1.2000e-004	0.0214	5.7200e-003	0.0272	3.2500e-003	5.3500e-003	8.6000e-003	0.0000	10.6174	10.6174	2.7000e-003	0.0000	10.6849

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3.2 Demolition - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.9000e-004	3.1300e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7645	0.7645	2.0000e-005	0.0000	0.7651
Total	3.8000e-004	1.0400e-003	3.2700e-003	1.0000e-005	8.6000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.3000e-004	0.0000	0.9551	0.9551	3.0000e-005	0.0000	0.9560

3.3 Site Preparation - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.2700e-003	0.0000	5.2700e-003	2.9000e-003	0.0000	2.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0227	0.0144	2.0000e-005		1.1200e-003	1.1200e-003		1.0300e-003	1.0300e-003	0.0000	1.8948	1.8948	6.0000e-004	0.0000	1.9098
Total	2.0800e-003	0.0227	0.0144	2.0000e-005	5.2700e-003	1.1200e-003	6.3900e-003	2.9000e-003	1.0300e-003	3.9300e-003	0.0000	1.8948	1.8948	6.0000e-004	0.0000	1.9098

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3.3 Site Preparation - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.3000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0815	0.0815	0.0000	0.0000	0.0816
Total	4.0000e-005	3.0000e-005	3.3000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0815	0.0815	0.0000	0.0000	0.0816

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.2700e-003	0.0000	5.2700e-003	2.9000e-003	0.0000	2.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0227	0.0144	2.0000e-005		1.1200e-003	1.1200e-003		1.0300e-003	1.0300e-003	0.0000	1.8948	1.8948	6.0000e-004	0.0000	1.9098
Total	2.0800e-003	0.0227	0.0144	2.0000e-005	5.2700e-003	1.1200e-003	6.3900e-003	2.9000e-003	1.0300e-003	3.9300e-003	0.0000	1.8948	1.8948	6.0000e-004	0.0000	1.9098

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3.3 Site Preparation - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.3000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0815	0.0815	0.0000	0.0000	0.0816
Total	4.0000e-005	3.0000e-005	3.3000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0815	0.0815	0.0000	0.0000	0.0816

3.4 Building Construction - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2373	1.8472	1.5750	2.6100e-003		0.1025	0.1025		0.0985	0.0985	0.0000	220.7004	220.7004	0.0452	0.0000	221.8311
Total	0.2373	1.8472	1.5750	2.6100e-003		0.1025	0.1025		0.0985	0.0985	0.0000	220.7004	220.7004	0.0452	0.0000	221.8311

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3.4 Building Construction - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4000e-003	0.1008	0.0253	2.2000e-004	5.4500e-003	6.6000e-004	6.1100e-003	1.5700e-003	6.3000e-004	2.2000e-003	0.0000	21.4025	21.4025	1.4800e-003	0.0000	21.4395
Worker	0.0107	8.5300e-003	0.0927	2.5000e-004	0.0244	1.9000e-004	0.0246	6.4800e-003	1.8000e-004	6.6600e-003	0.0000	22.6589	22.6589	7.1000e-004	0.0000	22.6766
Total	0.0141	0.1093	0.1180	4.7000e-004	0.0298	8.5000e-004	0.0307	8.0500e-003	8.1000e-004	8.8600e-003	0.0000	44.0614	44.0614	2.1900e-003	0.0000	44.1161

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2373	1.8472	1.5750	2.6100e-003		0.1025	0.1025		0.0985	0.0985	0.0000	220.7002	220.7002	0.0452	0.0000	221.8308
Total	0.2373	1.8472	1.5750	2.6100e-003		0.1025	0.1025		0.0985	0.0985	0.0000	220.7002	220.7002	0.0452	0.0000	221.8308

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3.4 Building Construction - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4000e-003	0.1008	0.0253	2.2000e-004	5.4500e-003	6.6000e-004	6.1100e-003	1.5700e-003	6.3000e-004	2.2000e-003	0.0000	21.4025	21.4025	1.4800e-003	0.0000	21.4395
Worker	0.0107	8.5300e-003	0.0927	2.5000e-004	0.0244	1.9000e-004	0.0246	6.4800e-003	1.8000e-004	6.6600e-003	0.0000	22.6589	22.6589	7.1000e-004	0.0000	22.6766
Total	0.0141	0.1093	0.1180	4.7000e-004	0.0298	8.5000e-004	0.0307	8.0500e-003	8.1000e-004	8.8600e-003	0.0000	44.0614	44.0614	2.1900e-003	0.0000	44.1161

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5800e-003	0.0207	0.0188	3.0000e-005		1.0800e-003	1.0800e-003		1.0400e-003	1.0400e-003	0.0000	2.6529	2.6529	5.3000e-004	0.0000	2.6662
Total	2.5800e-003	0.0207	0.0188	3.0000e-005		1.0800e-003	1.0800e-003		1.0400e-003	1.0400e-003	0.0000	2.6529	2.6529	5.3000e-004	0.0000	2.6662

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3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.1200e-003	2.8000e-004	0.0000	7.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2583	0.2583	2.0000e-005	0.0000	0.2587
Worker	1.2000e-004	9.0000e-005	1.0200e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2667	0.2667	1.0000e-005	0.0000	0.2669
Total	1.6000e-004	1.2100e-003	1.3000e-003	0.0000	3.7000e-004	1.0000e-005	3.7000e-004	1.0000e-004	1.0000e-005	1.0000e-004	0.0000	0.5249	0.5249	3.0000e-005	0.0000	0.5255

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5800e-003	0.0207	0.0188	3.0000e-005		1.0800e-003	1.0800e-003		1.0400e-003	1.0400e-003	0.0000	2.6529	2.6529	5.3000e-004	0.0000	2.6662
Total	2.5800e-003	0.0207	0.0188	3.0000e-005		1.0800e-003	1.0800e-003		1.0400e-003	1.0400e-003	0.0000	2.6529	2.6529	5.3000e-004	0.0000	2.6662

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3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.1200e-003	2.8000e-004	0.0000	7.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2583	0.2583	2.0000e-005	0.0000	0.2587
Worker	1.2000e-004	9.0000e-005	1.0200e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2667	0.2667	1.0000e-005	0.0000	0.2669
Total	1.6000e-004	1.2100e-003	1.3000e-003	0.0000	3.7000e-004	1.0000e-005	3.7000e-004	1.0000e-004	1.0000e-005	1.0000e-004	0.0000	0.5249	0.5249	3.0000e-005	0.0000	0.5255

3.5 Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539

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3.5 Paving - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.1000e-004	1.2300e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3210	0.3210	1.0000e-005	0.0000	0.3212
Total	1.5000e-004	1.1000e-004	1.2300e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3210	0.3210	1.0000e-005	0.0000	0.3212

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539

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3.5 Paving - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.1000e-004	1.2300e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3210	0.3210	1.0000e-005	0.0000	0.3212
Total	1.5000e-004	1.1000e-004	1.2300e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3210	0.3210	1.0000e-005	0.0000	0.3212

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

PARs 1146 series and PR 1100

B-1 - 21

September 2018

PAR 1146 series SCR - South Coast AQMD Air District, Annual

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PAR 1146 series SCR - South Coast AQMD Air District, Annual

5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

PAR 1146 series SCR - South Coast AQMD Air District, Annual

5.3 Energy by Land Use - Electricity**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail**6.1 Mitigation Measures Area**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

PAR 1146 series SCR - South Coast AQMD Air District, Annual

6.2 Area by SubCategory**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

7.0 Water Detail

PAR 1146 series SCR - South Coast AQMD Air District, Annual

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

PAR 1146 series SCR - South Coast AQMD Air District, Annual

7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail**8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

PAR 1146 series SCR - South Coast AQMD Air District, Annual

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

PAR 1146 series SCR - South Coast AQMD Air District, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction of a SCR System (Summer)

PAR 1146 series SCR - South Coast AQMD Air District, Summer

PAR 1146 series SCR
South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	9			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series SCR - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 10 days; Site Preparation: 2 days; Building Construction: 250 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Demolition - 1 acre = 43,560 square feet

Trips and VMT - Demolition: 15 Worker Trips, 0 Vendor Trips, 5 Hauling Trips

Site Preparation: 8 Work Trips, 0 Vendor Trips, 0 Hauling Trips

Building Construction: 18 Worker Trips, 7 Vendor Trips, 0 Hauling Trips

Paving: 13 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	250.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	2.00
tblConstructionPhase	PhaseEndDate	2/21/2018	1/3/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	2/21/2018	1/10/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/16/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/20/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/4/2020

PAR 1146 series SCR - South Coast AQMD Air District, Summer

tblConstructionPhase	PhaseStartDate	2/22/2018	1/15/2019
tblGrading	AcresOfGrading	1.00	0.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00

PAR 1146 series SCR - South Coast AQMD Air District, Summer

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	198.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	13.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

PAR 1146 series SCR - South Coast AQMD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.2939	23.0369	17.4919	0.0261	5.3588	1.1452	6.4825	2.9202	1.0719	3.9540	0.0000	2,560.237 9	2,560.237 9	0.6638	0.0000	2,575.318 4
2020	1.8267	14.5786	13.4094	0.0250	0.2460	0.7260	0.9720	0.0663	0.6976	0.7639	0.0000	2,347.664 9	2,347.664 9	0.4365	0.0000	2,357.895 4
Maximum	2.2939	23.0369	17.4919	0.0261	5.3588	1.1452	6.4825	2.9202	1.0719	3.9540	0.0000	2,560.237 9	2,560.237 9	0.6638	0.0000	2,575.318 4

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.2939	23.0369	17.4919	0.0261	5.3588	1.1452	6.4825	2.9202	1.0719	3.9540	0.0000	2,560.237 9	2,560.237 9	0.6638	0.0000	2,575.318 4
2020	1.8267	14.5786	13.4094	0.0250	0.2460	0.7260	0.9720	0.0663	0.6976	0.7639	0.0000	2,347.664 9	2,347.664 9	0.4365	0.0000	2,357.895 4
Maximum	2.2939	23.0369	17.4919	0.0261	5.3588	1.1452	6.4825	2.9202	1.0719	3.9540	0.0000	2,560.237 9	2,560.237 9	0.6638	0.0000	2,575.318 4

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PAR 1146 series SCR - South Coast AQMD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

PAR 1146 series SCR - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/14/2019	5	10	
2	Site Preparation	Site Preparation	1/15/2019	1/16/2019	5	2	
3	Building Construction	Building Construction	1/20/2019	1/3/2020	5	250	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series SCR - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Paving Equipment	1	8.00	131	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Plate Compactors	1	6.00	8	0.43
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	8.00	46	0.45
Building Construction	Aerial Lifts	1	8.00	63	0.31
Demolition	Cranes	1	8.00	226	0.29
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Site Preparation	Graders	1	8.00	187	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series SCR - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	7	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	15.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction**3.2 Demolition - 2019****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702		2,340.748 7	2,340.748 7	0.5948		2,355.618 4
Total	2.2163	22.8402	16.7900	0.0239	4.2879	1.1433	5.4312	0.6492	1.0702	1.7194		2,340.748 7	2,340.748 7	0.5948		2,355.618 4

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.1100e-003	0.1456	0.0279	3.9000e-004	8.7400e-003	5.4000e-004	9.2800e-003	2.3900e-003	5.2000e-004	2.9100e-003		42.3409	42.3409	2.8900e-003		42.4131
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0511	0.6740	1.7800e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		177.1484	177.1484	5.5400e-003		177.2869
Total	0.0776	0.1967	0.7019	2.1700e-003	0.1764	1.8400e-003	0.1783	0.0469	1.7200e-003	0.0486		219.4892	219.4892	8.4300e-003		219.6999

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702	0.0000	2,340.7487	2,340.7487	0.5948		2,355.6184
Total	2.2163	22.8402	16.7900	0.0239	4.2879	1.1433	5.4312	0.6492	1.0702	1.7194	0.0000	2,340.7487	2,340.7487	0.5948		2,355.6184

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.1100e-003	0.1456	0.0279	3.9000e-004	8.7400e-003	5.4000e-004	9.2800e-003	2.3900e-003	5.2000e-004	2.9100e-003		42.3409	42.3409	2.8900e-003		42.4131
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0511	0.6740	1.7800e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		177.1484	177.1484	5.5400e-003		177.2869
Total	0.0776	0.1967	0.7019	2.1700e-003	0.1764	1.8400e-003	0.1783	0.0469	1.7200e-003	0.0486		219.4892	219.4892	8.4300e-003		219.6999

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332		2,088.679 2	2,088.679 2	0.6608		2,105.200 1
Total	2.0758	22.6996	14.3849	0.0211	5.2693	1.1231	6.3924	2.8965	1.0332	3.9297		2,088.679 2	2,088.679 2	0.6608		2,105.200 1

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332	0.0000	2,088.679 2	2,088.679 2	0.6608		2,105,200 1
Total	2.0758	22.6996	14.3849	0.0211	5.2693	1.1231	6.3924	2.8965	1.0332	3.9297	0.0000	2,088.679 2	2,088.679 2	0.6608		2,105,200 1

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0270	0.8010	0.1936	1.8100e-003	0.0448	5.3100e-003	0.0501	0.0129	5.0800e-003	0.0180		193.3538	193.3538	0.0128		193.6736
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	0.1151	0.8623	1.0024	3.9500e-003	0.2460	6.8800e-003	0.2529	0.0663	6.5200e-003	0.0728		405.9318	405.9318	0.0194		406.4179

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0270	0.8010	0.1936	1.8100e-003	0.0448	5.3100e-003	0.0501	0.0129	5.0800e-003	0.0180		193.3538	193.3538	0.0128		193.6736
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	0.1151	0.8623	1.0024	3.9500e-003	0.2460	6.8800e-003	0.2529	0.0663	6.5200e-003	0.0728		405.9318	405.9318	0.0194		406.4179

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927		1,949.5559	1,949.5559	0.3912		1,959.3368
Total	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927		1,949.5559	1,949.5559	0.3912		1,959.3368

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0230	0.7346	0.1749	1.8000e-003	0.0448	3.6400e-003	0.0484	0.0129	3.4800e-003	0.0164		192.1139	192.1139	0.0121		192.4155
Worker	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432
Total	0.1044	0.7893	0.9108	3.8700e-003	0.2460	5.1700e-003	0.2512	0.0663	4.8900e-003	0.0711		398.1091	398.1091	0.0180		398.5587

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927	0.0000	1,949.5559	1,949.5559	0.3912		1,959.3368
Total	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927	0.0000	1,949.5559	1,949.5559	0.3912		1,959.3368

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0230	0.7346	0.1749	1.8000e-003	0.0448	3.6400e-003	0.0484	0.0129	3.4800e-003	0.0164		192.1139	192.1139	0.0121		192.4155
Worker	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432
Total	0.1044	0.7893	0.9108	3.8700e-003	0.2460	5.1700e-003	0.2512	0.0663	4.8900e-003	0.0711		398.1091	398.1091	0.0180		398.5587

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812
Total	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812
Total	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series SCR - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N
PARs 1146 series and PR 1100

PAR 1146 series SCR - South Coast AQMD Air District, Summer

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

PAR 1146 series SCR - South Coast AQMD Air District, Summer

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

PAR 1146 series SCR - South Coast AQMD Air District, Summer

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

7.0 Water Detail

PAR 1146 series SCR - South Coast AQMD Air District, Summer

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction of a SCR System (Winter)

PAR 1146 series SCR - South Coast AQMD Air District, Winter

PAR 1146 series SCR
South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	9			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series SCR - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 10 days; Site Preparation: 2 days; Building Construction: 250 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Demolition - 1 acre = 43,560 square feet

Trips and VMT - Demolition: 15 Worker Trips, 0 Vendor Trips, 5 Hauling Trips

Site Preparation: 8 Work Trips, 0 Vendor Trips, 0 Hauling Trips

Building Construction: 18 Worker Trips, 7 Vendor Trips, 0 Hauling Trips

Paving: 13 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	250.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	2.00
tblConstructionPhase	PhaseEndDate	2/21/2018	1/3/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	2/21/2018	1/10/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/16/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/20/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/4/2020

PAR 1146 series SCR - South Coast AQMD Air District, Winter

tblConstructionPhase	PhaseStartDate	2/22/2018	1/15/2019
tblGrading	AcresOfGrading	1.00	0.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00

PAR 1146 series SCR - South Coast AQMD Air District, Winter

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	198.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	13.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

PAR 1146 series SCR - South Coast AQMD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.3005	23.0437	17.4282	0.0260	5.3588	1.1452	6.4825	2.9202	1.0720	3.9540	0.0000	2,548.0195	2,548.0195	0.6636	0.0000	2,563.0942
2020	1.8352	14.5830	13.3562	0.0248	0.2460	0.7260	0.9720	0.0663	0.6977	0.7639	0.0000	2,328.7805	2,328.7805	0.4363	0.0000	2,339.0234
Maximum	2.3005	23.0437	17.4282	0.0260	5.3588	1.1452	6.4825	2.9202	1.0720	3.9540	0.0000	2,548.0195	2,548.0195	0.6636	0.0000	2,563.0942

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.3005	23.0437	17.4282	0.0260	5.3588	1.1452	6.4825	2.9202	1.0720	3.9540	0.0000	2,548.0195	2,548.0195	0.6636	0.0000	2,563.0942
2020	1.8352	14.5830	13.3562	0.0248	0.2460	0.7260	0.9720	0.0663	0.6977	0.7639	0.0000	2,328.7805	2,328.7805	0.4363	0.0000	2,339.0234
Maximum	2.3005	23.0437	17.4282	0.0260	5.3588	1.1452	6.4825	2.9202	1.0720	3.9540	0.0000	2,548.0195	2,548.0195	0.6636	0.0000	2,563.0942

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PAR 1146 series SCR - South Coast AQMD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

PAR 1146 series SCR - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/14/2019	5	10	
2	Site Preparation	Site Preparation	1/15/2019	1/16/2019	5	2	
3	Building Construction	Building Construction	1/20/2019	1/3/2020	5	250	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series SCR - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Paving Equipment	1	8.00	131	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Plate Compactors	1	6.00	8	0.43
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	8.00	46	0.45
Building Construction	Aerial Lifts	1	8.00	63	0.31
Demolition	Cranes	1	8.00	226	0.29
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Site Preparation	Graders	1	8.00	187	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series SCR - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	7	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	15.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702		2,340.748 7	2,340.748 7	0.5948		2,355.618 4
Total	2.2163	22.8402	16.7900	0.0239	4.2879	1.1433	5.4312	0.6492	1.0702	1.7194		2,340.748 7	2,340.748 7	0.5948		2,355.618 4

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2300e-003	0.1475	0.0301	3.9000e-004	8.7400e-003	5.5000e-004	9.2900e-003	2.3900e-003	5.3000e-004	2.9200e-003		41.5725	41.5725	3.0200e-003		41.6480
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6081	1.6600e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		165.6984	165.6984	5.1800e-003		165.8278
Total	0.0842	0.2035	0.6382	2.0500e-003	0.1764	1.8500e-003	0.1783	0.0469	1.7300e-003	0.0486		207.2709	207.2709	8.2000e-003		207.4758

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702	0.0000	2,340.7487	2,340.7487	0.5948		2,355,6184
Total	2.2163	22.8402	16.7900	0.0239	4.2879	1.1433	5.4312	0.6492	1.0702	1.7194	0.0000	2,340.7487	2,340.7487	0.5948		2,355,6184

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2300e-003	0.1475	0.0301	3.9000e-004	8.7400e-003	5.5000e-004	9.2900e-003	2.3900e-003	5.3000e-004	2.9200e-003		41.5725	41.5725	3.0200e-003		41.6480
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6081	1.6600e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		165.6984	165.6984	5.1800e-003		165.8278
Total	0.0842	0.2035	0.6382	2.0500e-003	0.1764	1.8500e-003	0.1783	0.0469	1.7300e-003	0.0486		207.2709	207.2709	8.2000e-003		207.4758

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332		2,088.679 2	2,088.679 2	0.6608		2,105.200 1
Total	2.0758	22.6996	14.3849	0.0211	5.2693	1.1231	6.3924	2.8965	1.0332	3.9297		2,088.679 2	2,088.679 2	0.6608		2,105.200 1

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332	0.0000	2,088.679 2	2,088.679 2	0.6608		2,105,200 1
Total	2.0758	22.6996	14.3849	0.0211	5.2693	1.1231	6.3924	2.8965	1.0332	3.9297	0.0000	2,088.679 2	2,088.679 2	0.6608		2,105,200 1

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0282	0.8015	0.2156	1.7600e-003	0.0448	5.3900e-003	0.0502	0.0129	5.1600e-003	0.0181		187.8214	187.8214	0.0138		188.1651
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	0.1242	0.8687	0.9453	3.7600e-003	0.2460	6.9600e-003	0.2530	0.0663	6.6000e-003	0.0729		386.6594	386.6594	0.0200		387.1584

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0282	0.8015	0.2156	1.7600e-003	0.0448	5.3900e-003	0.0502	0.0129	5.1600e-003	0.0181		187.8214	187.8214	0.0138		188.1651
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	0.1242	0.8687	0.9453	3.7600e-003	0.2460	6.9600e-003	0.2530	0.0663	6.6000e-003	0.0729		386.6594	386.6594	0.0200		387.1584

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927		1,949.5559	1,949.5559	0.3912		1,959.3368
Total	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927		1,949.5559	1,949.5559	0.3912		1,959.3368

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0241	0.7338	0.1950	1.7500e-003	0.0448	3.6900e-003	0.0485	0.0129	3.5300e-003	0.0164		186.5590	186.5590	0.0130		186.8828
Worker	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038
Total	0.1129	0.7937	0.8576	3.6800e-003	0.2460	5.2200e-003	0.2512	0.0663	4.9400e-003	0.0712		379.2247	379.2247	0.0185		379.6867

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927	0.0000	1,949.5559	1,949.5559	0.3912		1,959.3368
Total	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927	0.0000	1,949.5559	1,949.5559	0.3912		1,959.3368

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0241	0.7338	0.1950	1.7500e-003	0.0448	3.6900e-003	0.0485	0.0129	3.5300e-003	0.0164		186.5590	186.5590	0.0130		186.8828
Worker	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038
Total	0.1129	0.7937	0.8576	3.6800e-003	0.2460	5.2200e-003	0.2512	0.0663	4.9400e-003	0.0712		379.2247	379.2247	0.0185		379.6867

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472
Total	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472
Total	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series SCR - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N
PARs 1146 series and PR 1100

PAR 1146 series SCR - South Coast AQMD Air District, Winter

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

PAR 1146 series SCR - South Coast AQMD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

PAR 1146 series SCR - South Coast AQMD Air District, Winter

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

7.0 Water Detail

PARs 1146 series and PR 1100

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September 2018

PAR 1146 series SCR - South Coast AQMD Air District, Winter

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B-2

Construction Emissions of Ultra-Low NOx Burners

Retrofit with Ultra-Low Nox Burners in 2019

PAR 1146 Series Affected Equipment	No. of Units	Construction Activity
Rule 1146 and 1146.1 units in RECLAIM	1	Install Ultra-Low NOx burners on 35 units during 2019

Construction Schedule - 1 day per unit

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Welding Machin	1	2	1

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Welding Machine (composite)	0.0344	0.1843	0.1832	0.0003	0.0117	25.6

Source: Off-road Mobile Source Emission Factors - Scenario Year 2019

[http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-\(scenario-years-2007-2025\).xls](http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls)

*Equipment is assumed to be diesel fueled.

Construction Vehicle (Mobile Source) Emission Factors for Year 2019	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Construction Related Activity	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Construction Worker Vehicle)	0.00034	0.00291	0.00030	0.00001	0.00010	0.00004	0.92780
Offsite (Delivery Truck - pickup truck)	0.00034	0.00291	0.00030	0.00001	0.00010	0.00004	0.92780

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2019

<https://www.arb.ca.gov/emfac/2014/>

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	2	25
Offsite (Delivery Truck - Medium Duty)	2	50

Incremental Increase in Onsite Combustion Emissions from Construction Equipment**Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)**

	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Welding Machine	0.07	0.37	0.37	0.00	0.02	51.20
TOTAL	0.07	0.37	0.37	0.00	0.02	51.20

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles**Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Construction Emissions (lbs/day)**

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Offsite (Construction Worker Vehicle)	0.03	0.29	0.03	0.00	0.01	0.00	92.78
Offsite (Delivery Truck - pickup truck)	0.07	0.58	0.06	0.00	0.02	0.01	185.56
TOTAL	0.10	0.87	0.09	0.00	0.03	0.01	278.34

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2019

<https://www.arb.ca.gov/emfac/2014/>**Total Incremental Combustion Emissions from Construction Activities**

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Ultra-low Nox burner (1 unit)	0.2	1	0.5	0.003	0.1	0.01	330
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Construction Equipment and Workers' Vehicles

Construction Activity	Total Project Hours of Operation*	Equipment Type	Diesel Fuel Usage (gal/hr)**	Diesel Fuel Usage (gal/project)**	Gasoline Fuel Usage (gal/yr)***
Operation of Portable Equipment	2	Welding Machines	1.177	2.35	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	2.50
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	N/A	5.00
		TOTAL		2.35	7.50

Notes:

*Assume construction will take approximately 1 day (8 hrs/day max), but welder will only be needed for ~2 hours per day.

**Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2014.

***Assume that construction workers' commute vehicle and pick-up truck use gasoline and get 20 mi/gal and round trip length is 50 miles.

Retrofit with Ultra-Low Nox Burners in 2020

PAR 1146 Series Affected Equipment	No. of Units	Construction Activity
Rule 1146 and 1146.1 units in RECLAIM	1	Install Ultra-Low NOx burners on 80 units during 2020

Construction Schedule - 1 day per unit

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Welding Machine	1	2	1

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Welding Machine (composite)	0.0310	0.1816	0.1735	0.0003	0.0102	25.6

Source: Off-road Mobile Source Emission Factors - Scenario Year 2019

[http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-\(scenario-years-2007-2025\).xls](http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls)

*Equipment is assumed to be diesel fueled.

Construction Vehicle (Mobile Source) Emission Factors for Year 2011	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Construction Related Activity	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Construction Worker Vehicle)	0.00031	0.00263	0.00026	0.00001	0.00010	0.00004	0.90138
Offsite (Delivery Truck - pickup truck)	0.00031	0.00263	0.00026	0.00001	0.00010	0.00004	0.90138

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2020

<https://www.arb.ca.gov/emfac/2014/>

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	2	25
Offsite (Delivery Truck - Medium Duty)	2	50

Incremental Increase in Onsite Combustion Emissions from Construction Equipment**Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)**

	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Welding Machine	0.06	0.36	0.35	0.00	0.02	51.20
TOTAL	0.06	0.36	0.35	0.00	0.02	51.20

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles**Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Construction Emissions (lbs/day)**

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Offsite (Construction Worker Vehicle)	0.03	0.26	0.03	0.00	0.01	0.00	90.14
Offsite (Delivery Truck - pickup truck)	0.06	0.53	0.05	0.00	0.02	0.01	180.28
TOTAL	0.09	0.79	0.08	0.00	0.03	0.01	270.41

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2020
<https://www.arb.ca.gov/emfac/2014/>

Total Incremental Combustion Emissions from Construction Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Ultra-low Nox burner (1 unit)	0.2	1	0.4	0.003	0.1	0.01	322
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Construction Equipment and Workers' Vehicles

Construction Activity	Total Project Hours of Operation*	Equipment Type	Diesel Fuel Usage (gal/hr)**	Diesel Fuel Usage (gal/project)**	Gasoline Fuel Usage (gal/yr)***
Operation of Portable Equipment	2	Welding Machines	1.177	2.35	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	2.50
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	N/A	5.00
		TOTAL		2.35	7.50

Notes:

*Assume construction will take approximately 1 day (8 hrs/day max), but welder will only be needed for ~2 hours per day.

**Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2014.

***Assume that construction workers' commute vehicle and pick-up truck use gasoline and get 20 mi/gal and round trip length is 50 miles.

Retrofit with Ultra-Low Nox Burners in 2021

PAR 1146 Series Affected Equipment	No. of Units	Construction Activity
Rule 1146 and 1146.1 units in RECLAIM	1	Install Ultra-Low NOx burners on 51 units during 2021

Construction Schedule - 1 day per unit

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Welding Machine	1	2	1

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Welding Machine (composite)	0.0280	0.1788	0.1635	0.0003	0.0088	25.6

Source: Off-road Mobile Source Emission Factors - Scenario Year 2019

[http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-\(scenario-years-2007-2025\).xls](http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls)

*Equipment is assumed to be diesel fueled.

Construction Vehicle (Mobile Source) Emission Factors for Year 2021	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Construction Related Activity	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Construction Worker Vehicle)	0.00029	0.00243	0.00023	0.00001	0.00010	0.00004	0.87361
Offsite (Delivery Truck - pickup truck)	0.00029	0.00243	0.00023	0.00001	0.00010	0.00004	0.87361

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2021

<https://www.arb.ca.gov/emfac/2014/>

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	2	25
Offsite (Delivery Truck - Medium Duty)	2	50

Incremental Increase in Onsite Combustion Emissions from Construction Equipment**Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)**

	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Welding Machine	0.06	0.36	0.33	0.00	0.02	51.20
TOTAL	0.06	0.36	0.33	0.00	0.02	51.20

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles**Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Construction Emissions (lbs/day)**

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Offsite (Construction Worker Vehicle)	0.03	0.24	0.02	0.00	0.01	0.00	87.36
Offsite (Delivery Truck - pickup truck)	0.06	0.49	0.05	0.00	0.02	0.01	174.72
TOTAL	0.09	0.73	0.07	0.00	0.03	0.01	262.08

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2021
<https://www.arb.ca.gov/emfac/2014/>

Total Incremental Combustion Emissions from Construction Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Ultra-low Nox burner (1 unit)	0.1	1	0.4	0.003	0.05	0.01	313
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Construction Equipment and Workers' Vehicles

Construction Activity	Total Project Hours of Operation*	Equipment Type	Diesel Fuel Usage (gal/hr)**	Diesel Fuel Usage (gal/project)**	Gasoline Fuel Usage (gal/yr)***
Operation of Portable Equipment	2	Welding Machines	1.177	2.35	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	2.50
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	N/A	5.00
		TOTAL		2.35	7.50

Notes:

*Assume construction will take approximately 1 day (8 hrs/day max), but welder will only be needed for ~2 hours per day.

**Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2014.

***Assume that construction workers' commute vehicle and pick-up truck use gasoline and get 20 mi/gal and round trip length is 50 miles.

Emissions Summary Due to Retrofits of Ultra-Low NOx Burners in 2019, 2020, and 2021

Peak Construction by Year	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)	CO2 (lbs/day)	CO2 (lbs/day)
2019									
TOTAL for 1 unit in one day	0.17	1.24	0.46	0.003	0.05	0.01	329.54	329.54	0.15
Peak Daily TOTAL for 10 units installed in one day	1.70	12.42	4.56	0.03	0.55	0.13	3295.39	n/a	n/a
Peak TOTAL for 35 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11533.85	5.23
Significance Threshold	75	550	100	150	150	55	n/a	n/a	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
2020									
TOTAL for 1 unit in one day	0.16	1.15	0.43	0.003	0.05	0.01	321.61	321.61	0.15
Peak Daily TOTAL for 10 units installed in one day	1.56	11.52	4.25	0.03	0.52	0.13	3216.14	n/a	n/a
Peak TOTAL for 35 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11256.48	5.10
Significance Threshold	75	550	100	150	150	55	n/a	n/a	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
2021									
TOTAL for 1 unit in one day	0.14	1.09	0.40	0.003	0.05	0.01	313.28	313.28	0.14
Peak Daily TOTAL for 10 units installed in one day	1.44	10.85	3.96	0.03	0.49	0.13	3132.84	n/a	n/a
Peak TOTAL for 23 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7205.52	3.27
Significance Threshold	75	550	100	150	150	55	n/a	n/a	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a

APPENDIX B-3

CalEEMod Files and Assumptions – Construction Emissions (Boiler Replacement)

CalEEMod Files and Assumptions – Construction Emissions

Construction for a Boiler Replacement (Annual)

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

PAR 1146 series Large Boiler Replacement South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	9			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 2 hours per day; Welders (1): 8 hours per day; Cement and Mortar Mixers (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Trips and VMT - Demolition: 2 Worker Trips, 0 Vendor Trips, 5 Hauling Trips

Site Preparation: 2 Work Trips, 0 Vendor Trips, 0 Hauling Trips

Building Construction: 2 Worker Trips, 1 Vendor Trips, 0 Hauling Trips

Paving: 2 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Demolition - Assume 1,000 square feet would be demo from existing pad

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	65.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	AcresOfGrading	2.50	0.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00

2.0 Emissions Summary

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0911	0.7523	0.6276	9.9000e-004	0.0149	0.0405	0.0554	7.6500e-003	0.0387	0.0463	0.0000	84.5310	84.5310	0.0181	0.0000	84.9826
2020	2.2800e-003	0.0225	0.0237	4.0000e-005	5.0000e-005	1.2400e-003	1.2900e-003	1.0000e-005	1.1400e-003	1.1600e-003	0.0000	3.1788	3.1788	9.8000e-004	0.0000	3.2033
Maximum	0.0911	0.7523	0.6276	9.9000e-004	0.0149	0.0405	0.0554	7.6500e-003	0.0387	0.0463	0.0000	84.5310	84.5310	0.0181	0.0000	84.9826

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0911	0.7523	0.6276	9.9000e-004	0.0149	0.0405	0.0554	7.6500e-003	0.0387	0.0463	0.0000	84.5309	84.5309	0.0181	0.0000	84.9825
2020	2.2800e-003	0.0225	0.0237	4.0000e-005	5.0000e-005	1.2400e-003	1.2900e-003	1.0000e-005	1.1400e-003	1.1600e-003	0.0000	3.1788	3.1788	9.8000e-004	0.0000	3.2033
Maximum	0.0911	0.7523	0.6276	9.9000e-004	0.0149	0.0405	0.0554	7.6500e-003	0.0387	0.0463	0.0000	84.5309	84.5309	0.0181	0.0000	84.9825

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	11-22-2018	2-21-2019	0.4910	0.4910
5	2-22-2019	5-21-2019	0.3464	0.3464
8	11-22-2019	2-21-2020	0.0248	0.0248
		Highest	0.4910	0.4910

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/15/2019	1/21/2019	5	5	
3	Building Construction	Building Construction	1/20/2019	4/19/2019	5	65	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	226	0.29
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Demolition	Welders	1	8.00	46	0.45
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Building Construction	Welders	2	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Paving Equipment	1	8.00	131	0.36
Paving	Plate Compactors	1	6.00	8	0.43
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	2.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9000e-004	0.0000	4.9000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.2046	0.1724	2.3000e-004		0.0107	0.0107		0.0101	0.0101	0.0000	19.8063	19.8063	4.5700e-003	0.0000	19.9204
Total	0.0229	0.2046	0.1724	2.3000e-004	4.9000e-004	0.0107	0.0112	7.0000e-005	0.0101	0.0102	0.0000	19.8063	19.8063	4.5700e-003	0.0000	19.9204

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3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	8.3000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2039	0.2039	1.0000e-005	0.0000	0.2040
Total	1.2000e-004	8.3000e-004	9.7000e-004	0.0000	2.6000e-004	0.0000	2.7000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.3945	0.3945	2.0000e-005	0.0000	0.3950

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9000e-004	0.0000	4.9000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.2046	0.1724	2.3000e-004		0.0107	0.0107		0.0101	0.0101	0.0000	19.8063	19.8063	4.5700e-003	0.0000	19.9204
Total	0.0229	0.2046	0.1724	2.3000e-004	4.9000e-004	0.0107	0.0112	7.0000e-005	0.0101	0.0102	0.0000	19.8063	19.8063	4.5700e-003	0.0000	19.9204

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3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	8.3000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2039	0.2039	1.0000e-005	0.0000	0.2040
Total	1.2000e-004	8.3000e-004	9.7000e-004	0.0000	2.6000e-004	0.0000	2.7000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.3945	0.3945	2.0000e-005	0.0000	0.3950

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0132	0.0000	0.0132	7.2400e-003	0.0000	7.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1800e-003	0.0567	0.0359	5.0000e-005		2.8000e-003	2.8000e-003		2.5800e-003	2.5800e-003	0.0000	4.7331	4.7331	1.5000e-003	0.0000	4.7706
Total	5.1800e-003	0.0567	0.0359	5.0000e-005	0.0132	2.8000e-003	0.0160	7.2400e-003	2.5800e-003	9.8200e-003	0.0000	4.7331	4.7331	1.5000e-003	0.0000	4.7706

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3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0510	0.0510	0.0000	0.0000	0.0510
Total	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0510	0.0510	0.0000	0.0000	0.0510

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0132	0.0000	0.0132	7.2400e-003	0.0000	7.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1800e-003	0.0567	0.0359	5.0000e-005		2.8000e-003	2.8000e-003		2.5800e-003	2.5800e-003	0.0000	4.7331	4.7331	1.5000e-003	0.0000	4.7706
Total	5.1800e-003	0.0567	0.0359	5.0000e-005	0.0132	2.8000e-003	0.0160	7.2400e-003	2.5800e-003	9.8200e-003	0.0000	4.7331	4.7331	1.5000e-003	0.0000	4.7706

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3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0510	0.0510	0.0000	0.0000	0.0510
Total	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0510	0.0510	0.0000	0.0000	0.0510

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0624	0.4861	0.4145	6.9000e-004		0.0270	0.0270		0.0259	0.0259	0.0000	58.0791	58.0791	0.0119	0.0000	58.3766
Total	0.0624	0.4861	0.4145	6.9000e-004		0.0270	0.0270		0.0259	0.0259	0.0000	58.0791	58.0791	0.0119	0.0000	58.3766

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3000e-004	3.7900e-003	9.5000e-004	1.0000e-005	2.0000e-004	2.0000e-005	2.3000e-004	6.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.8046	0.8046	6.0000e-005	0.0000	0.8060
Worker	3.1000e-004	2.5000e-004	2.7100e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	1.9000e-004	0.0000	0.6625	0.6625	2.0000e-005	0.0000	0.6631
Total	4.4000e-004	4.0400e-003	3.6600e-003	2.0000e-005	9.1000e-004	3.0000e-005	9.5000e-004	2.5000e-004	3.0000e-005	2.7000e-004	0.0000	1.4672	1.4672	8.0000e-005	0.0000	1.4691

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0624	0.4861	0.4145	6.9000e-004		0.0270	0.0270		0.0259	0.0259	0.0000	58.0790	58.0790	0.0119	0.0000	58.3765
Total	0.0624	0.4861	0.4145	6.9000e-004		0.0270	0.0270		0.0259	0.0259	0.0000	58.0790	58.0790	0.0119	0.0000	58.3765

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3000e-004	3.7900e-003	9.5000e-004	1.0000e-005	2.0000e-004	2.0000e-005	2.3000e-004	6.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.8046	0.8046	6.0000e-005	0.0000	0.8060
Worker	3.1000e-004	2.5000e-004	2.7100e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	1.9000e-004	0.0000	0.6625	0.6625	2.0000e-005	0.0000	0.6631
Total	4.4000e-004	4.0400e-003	3.6600e-003	2.0000e-005	9.1000e-004	3.0000e-005	9.5000e-004	2.5000e-004	3.0000e-005	2.7000e-004	0.0000	1.4672	1.4672	8.0000e-005	0.0000	1.4691

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539

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3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0494
Total	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0494

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539

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3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0494
Total	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0494

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N
PARs 1146 series and PR 1100

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

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6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

7.0 Water Detail

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction for a Boiler Replacement (Summer)

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

PAR 1146 series Large Boiler Replacement South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	9			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 2 hours per day; Welders (1): 8 hours per day; Cement and Mortar Mixers (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Trips and VMT - Demolition: 2 Worker Trips, 0 Vendor Trips, 5 Hauling Trips

Site Preparation: 2 Work Trips, 0 Vendor Trips, 0 Hauling Trips

Building Construction: 2 Worker Trips, 1 Vendor Trips, 0 Hauling Trips

Paving: 2 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Demolition - Assume 1,000 square feet would be demo from existing pad

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	65.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	AcresOfGrading	2.50	0.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00

2.0 Emissions Summary

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3237	58.3077	44.6733	0.0663	5.3964	3.0252	8.4216	2.9247	2.8448	5.7695	0.0000	6,359.749 9	6,359.749 9	1.5727	0.0000	6,399.067 8
2020	0.9127	9.0027	9.4820	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,402.714 9	1,402.714 9	0.4329	0.0000	1,413.538 0
Maximum	6.3237	58.3077	44.6733	0.0663	5.3964	3.0252	8.4216	2.9247	2.8448	5.7695	0.0000	6,359.749 9	6,359.749 9	1.5727	0.0000	6,399.067 8

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3237	58.3077	44.6733	0.0663	5.3964	3.0252	8.4216	2.9247	2.8448	5.7695	0.0000	6,359.749 9	6,359.749 9	1.5727	0.0000	6,399.067 8
2020	0.9127	9.0027	9.4820	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,402.714 9	1,402.714 9	0.4329	0.0000	1,413.538 0
Maximum	6.3237	58.3077	44.6733	0.0663	5.3964	3.0252	8.4216	2.9247	2.8448	5.7695	0.0000	6,359.749 9	6,359.749 9	1.5727	0.0000	6,399.067 8

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/15/2019	1/21/2019	5	5	
3	Building Construction	Building Construction	1/20/2019	4/19/2019	5	65	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	226	0.29
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Demolition	Welders	1	8.00	46	0.45
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Building Construction	Welders	2	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Paving Equipment	1	8.00	131	0.36
Paving	Plate Compactors	1	6.00	8	0.43
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	2.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139		2,183.2691	2,183.2691	0.5033		2,195.8508
Total	2.2936	20.4634	17.2377	0.0230	0.0492	1.0722	1.1214	7.4500e-003	1.0139	1.0214		2,183.2691	2,183.2691	0.5033		2,195.8508

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0500e-003	0.0728	0.0139	2.0000e-004	4.3700e-003	2.7000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		21.1704	21.1704	1.4400e-003		21.2065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	0.0118	0.0796	0.1038	4.4000e-004	0.0267	4.4000e-004	0.0272	7.1300e-003	4.2000e-004	7.5500e-003		44.7902	44.7902	2.1800e-003		44.8448

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139	0.0000	2,183.2691	2,183.2691	0.5033		2,195,8508
Total	2.2936	20.4634	17.2377	0.0230	0.0492	1.0722	1.1214	7.4500e-003	1.0139	1.0214	0.0000	2,183.2691	2,183.2691	0.5033		2,195,8508

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0500e-003	0.0728	0.0139	2.0000e-004	4.3700e-003	2.7000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		21.1704	21.1704	1.4400e-003		21.2065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	0.0118	0.0796	0.1038	4.4000e-004	0.0267	4.4000e-004	0.0272	7.1300e-003	4.2000e-004	7.5500e-003		44.7902	44.7902	2.1800e-003		44.8448

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318		2,086.9458	2,086.9458	0.6603		2,103.4529
Total	2.0735	22.6793	14.3712	0.0211	5.2693	1.1215	6.3909	2.8965	1.0318	3.9283		2,086.9458	2,086.9458	0.6603		2,103.4529

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318	0.0000	2,086.9457	2,086.9457	0.6603		2,103.4529
Total	2.0735	22.6793	14.3712	0.0211	5.2693	1.1215	6.3909	2.8965	1.0318	3.9283	0.0000	2,086.9457	2,086.9457	0.6603		2,103.4529

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.8600e-003	0.1144	0.0277	2.6000e-004	6.4000e-003	7.6000e-004	7.1600e-003	1.8400e-003	7.3000e-004	2.5700e-003		27.6220	27.6220	1.8300e-003		27.6677
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	0.0137	0.1212	0.1175	5.0000e-004	0.0288	9.3000e-004	0.0297	7.7700e-003	8.9000e-004	8.6600e-003		51.2418	51.2418	2.5700e-003		51.3059

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.8600e-003	0.1144	0.0277	2.6000e-004	6.4000e-003	7.6000e-004	7.1600e-003	1.8400e-003	7.3000e-004	2.5700e-003		27.6220	27.6220	1.8300e-003		27.6677
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	0.0137	0.1212	0.1175	5.0000e-004	0.0288	9.3000e-004	0.0297	7.7700e-003	8.9000e-004	8.6600e-003		51.2418	51.2418	2.5700e-003		51.3059

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.0500e-003	6.0800e-003	0.0818	2.3000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		22.8884	22.8884	6.6000e-004		22.9048
Total	9.0500e-003	6.0800e-003	0.0818	2.3000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		22.8884	22.8884	6.6000e-004		22.9048

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.0500e-003	6.0800e-003	0.0818	2.3000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		22.8884	22.8884	6.6000e-004		22.9048
Total	9.0500e-003	6.0800e-003	0.0818	2.3000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		22.8884	22.8884	6.6000e-004		22.9048

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N
PARs 1146 series and PR 1100

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

7.0 Water Detail

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction for a Boiler Replacement (Winter)

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

PAR 1146 series Large Boiler Replacement

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	31
Climate Zone	9			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 2 hours per day; Welders (1): 8 hours per day; Cement and Mortar Mixers (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Trips and VMT - Demolition: 2 Worker Trips, 0 Vendor Trips, 5 Hauling Trips

Site Preparation: 2 Work Trips, 0 Vendor Trips, 0 Hauling Trips

Building Construction: 2 Worker Trips, 1 Vendor Trips, 0 Hauling Trips

Paving: 2 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Demolition - Assume 1,000 square feet would be demo from existing pad

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	65.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	AcresOfGrading	2.50	0.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00

2.0 Emissions Summary

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3265	58.3107	44.6512	0.0662	5.3964	3.0253	8.4217	2.9247	2.8448	5.7695	0.0000	6,353.995 3	6,353.995 3	1.5728	0.0000	6,393.314 7
2020	0.9135	9.0033	9.4739	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,401.233 9	1,401.233 9	0.4329	0.0000	1,412.055 8
Maximum	6.3265	58.3107	44.6512	0.0662	5.3964	3.0253	8.4217	2.9247	2.8448	5.7695	0.0000	6,353.995 3	6,353.995 3	1.5728	0.0000	6,393.314 7

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3265	58.3107	44.6512	0.0662	5.3964	3.0253	8.4217	2.9247	2.8448	5.7695	0.0000	6,353.995 3	6,353.995 3	1.5728	0.0000	6,393.314 7
2020	0.9135	9.0033	9.4739	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,401.233 9	1,401.233 9	0.4329	0.0000	1,412.055 8
Maximum	6.3265	58.3107	44.6512	0.0662	5.3964	3.0253	8.4217	2.9247	2.8448	5.7695	0.0000	6,353.995 3	6,353.995 3	1.5728	0.0000	6,393.314 7

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/15/2019	1/21/2019	5	5	
3	Building Construction	Building Construction	1/20/2019	4/19/2019	5	65	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	226	0.29
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Demolition	Welders	1	8.00	46	0.45
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Building Construction	Welders	2	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Paving Equipment	1	8.00	131	0.36
Paving	Plate Compactors	1	6.00	8	0.43
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	2.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139		2,183.2691	2,183.2691	0.5033		2,195.8508
Total	2.2936	20.4634	17.2377	0.0230	0.0492	1.0722	1.1214	7.4500e-003	1.0139	1.0214		2,183.2691	2,183.2691	0.5033		2,195.8508

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.0738	0.0151	1.9000e-004	4.3700e-003	2.8000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		20.7863	20.7863	1.5100e-003		20.8240
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	0.0128	0.0812	0.0962	4.1000e-004	0.0267	4.5000e-004	0.0272	7.1300e-003	4.2000e-004	7.5500e-003		42.8794	42.8794	2.2000e-003		42.9344

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139	0.0000	2,183.2691	2,183.2691	0.5033		2,195,8508
Total	2.2936	20.4634	17.2377	0.0230	0.0492	1.0722	1.1214	7.4500e-003	1.0139	1.0214	0.0000	2,183.2691	2,183.2691	0.5033		2,195,8508

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.0738	0.0151	1.9000e-004	4.3700e-003	2.8000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		20.7863	20.7863	1.5100e-003		20.8240
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	0.0128	0.0812	0.0962	4.1000e-004	0.0267	4.5000e-004	0.0272	7.1300e-003	4.2000e-004	7.5500e-003		42.8794	42.8794	2.2000e-003		42.9344

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318		2,086.9458	2,086.9458	0.6603		2,103.4529
Total	2.0735	22.6793	14.3712	0.0211	5.2693	1.1215	6.3909	2.8965	1.0318	3.9283		2,086.9458	2,086.9458	0.6603		2,103.4529

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318	0.0000	2,086.9457	2,086.9457	0.6603		2,103.4529
Total	2.0735	22.6793	14.3712	0.0211	5.2693	1.1215	6.3909	2.8965	1.0318	3.9283	0.0000	2,086.9457	2,086.9457	0.6603		2,103.4529

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.0300e-003	0.1145	0.0308	2.5000e-004	6.4000e-003	7.7000e-004	7.1700e-003	1.8400e-003	7.4000e-004	2.5800e-003		26.8316	26.8316	1.9600e-003		26.8807
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	0.0147	0.1220	0.1119	4.7000e-004	0.0288	9.4000e-004	0.0297	7.7700e-003	9.0000e-004	8.6700e-003		48.9247	48.9247	2.6500e-003		48.9911

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.0300e-003	0.1145	0.0308	2.5000e-004	6.4000e-003	7.7000e-004	7.1700e-003	1.8400e-003	7.4000e-004	2.5800e-003		26.8316	26.8316	1.9600e-003		26.8807
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	0.0147	0.1220	0.1119	4.7000e-004	0.0288	9.4000e-004	0.0297	7.7700e-003	9.0000e-004	8.6700e-003		48.9247	48.9247	2.6500e-003		48.9911

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.8700e-003	6.6600e-003	0.0736	2.1000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		21.4073	21.4073	6.1000e-004		21.4227
Total	9.8700e-003	6.6600e-003	0.0736	2.1000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		21.4073	21.4073	6.1000e-004		21.4227

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.8700e-003	6.6600e-003	0.0736	2.1000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		21.4073	21.4073	6.1000e-004		21.4227
Total	9.8700e-003	6.6600e-003	0.0736	2.1000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		21.4073	21.4073	6.1000e-004		21.4227

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N
PARs 1146 series and PR 1100

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

7.0 Water Detail

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B-4

Operational Emissions

Appendix B-4

CEQA Impact Evaluations - Assumptions and Calculations

(2018/08/28 rev)

Emissions Summary

PARs 1146 series and PR 1100	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day
Increased Delivery Trucks	19.25	30.43	2.18	1.22	4.54	0.12
Total	19.25	30.43	2.18	1.22	4.54	0.12

By Vehicle Class	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr
Diesel Delivery Trucks (T6 Construction Truck)	19.25	30.43	2.18	1.22	4.54	0.12	39.53	0.001	-	39.55
Total	19.25	30.43	2.18	1.22	4.54	0.12	39.53	0.001	-	39.55

All sites	
Max. # used/day	Max. # day used/yr
65	452

Note:

1. It is conservatively assumed that there will be 56 units at 32 facilities affected by PARs 1146 series and PR 1100.
2. Peak daily trips assume one ammonia/urea delivery occurs at each facility, except for Facility 6 in which there will be two ammonia truck deliveries. Truck trip distances to deliver ammonia are assumed to be 100 miles round-trip.
3. No additional employees are anticipated to be needed to operate the new SCR systems; the existing work force per affected facility is expected to be sufficient. As such, no workers' travel emissions are anticipated from the operation of the new SCR systems.
4. It is assumed heavy duty trucks would be used to deliver ammonia/urea and catalyst.
5. Values in table may differ due to rounding.

Delivery Trucks (Ammonia and Catalyst) - T6 instate construction heavy (T6) - each

	CO	NOx	PM10	PM2.5	VOC	SOX	CO2	CH4	N2O	CO2e
lb/mile	0.0030	0.0047	0.0003	0.0002	0.0007	0.00002	1.93	0.000042	-	1.93
lb/day, MT/day for GHG	0.30	0.47	0.03	0.02	0.07	0.002	0.09	0.000002	-	0.09

VMT, mile/day
100.0

EF: from EMFAC2017 - Year 2019

APPENDIX C

Tier III Risk Assessment Calculations of Diesel PM

(Version 8.0 & Attachment M, Revision Mar 2016) - RiskTool (V1.03)

A/N	PAR 1146 series/PR 1100
Facility Name	PAR 1146 series/PR 1100

Source Type:	O - Other	
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	YES	

FOR SOURCES TYPE OTHER THAN CREMATORY, BOILER, ICES, OR PRESSURE WASHER, FILL IN THE TABLE BELOW

PARs 1146 series and PR 1100		C - 1

TIER 3 SCREEN INPUT & CANCER BURDEN CALCULATION

(Version 8.0 & Attachment M, Revision Mar 2016) - RiskTool (V1.03)

Screening program used	AERSCREEN
Convert 1-hr to Annual Conc. Factor	0.1

Instructions: Run a screening program at 1 lb/hr rate to get the max 1-hr concentrations at residential & commercial receptors. Enter values into the yellow highlighted cells in the table below.

Modeling emissions rate	0.1260	g/sec
Modeling emissions rate	1.00	lbs/hr
Modeling emissions rate	4.38	tons/yr
Max Hours per day	24	hr/day
Days per week	7	dy/wk
Weeks per year	52	wk/yr

MODELING RESULTS - MAX ONE HOUR

Distance residential	25	meters
Max. 1-hr Conc. at Residential receptor	247.9	µg/m ³
Annualized Conc. Residential	24.79	µg/m ³
Distance Commerical	25	meters
Max. 1-hr Conc. at Comm. receptor	247.9	µg/m ³
Annualized Conc. Commercial	24.79	µg/m ³

Annualized X/Q

X/Q Residential	5.665	(µg/m ³)/(tons/yr)
X/Q Commercial	5.665	(µg/m ³)/(tons/yr)

Hourly X/Q (X/Q Max)

X/Q Residential	248.119	(µg/m ³)/(lbs/hr)
X/Q Commercial	248.119	(µg/m ³)/(lbs/hr)

A/N: PAR 1146 series/PR 1100

Fac: R 1146 series/PR 1100

SCREEN INPUT DATA - BRITISH UNITS

Actual exhaust rate	10000.00	acfm
Temperature	68.00	°F
Stack diameter	24.00	in
Stack height	13.50	ft
Modeling emissions rate	1.00	lb/hr

SCREEN INPUT DATA - METRIC UNITS

Temperature	293.000	K
Stack diameter	0.610	meters
Stack area	0.292	m ²
Stack height	4.115	meters
Stack velocity	16.179	m/s
Modeling emissions rate	0.12611	g/s

TIER 3 SCREENING RISK ASSESSMENT REPORT**(Version 8.0 & Attachment M, Revision Mar 2016) - RiskTool (V1.03)****A/N:** 3 1146 series/PR 1100**Application deemed complete date:** 2/28/2018**Fac:** 3 1146 series/PR 1100**2. Tier 3 Data**

Equipment Type	<u>Other</u>		<u>No T-BACT</u>	
Operation Schedule	<u>24</u> hours/day;	<u>7</u> days/week;	<u>52</u> weeks/year	
Stack Height	<u>10</u> ft			
Distance - Residential	<u>25</u> m			
Distance - Commercial	<u>25</u> m			
Meteorological Station	<u>Redlands</u>			

Dispersion Factors tables

Point Source

For Chronic X/Q	Table 3
For Acute X/Q max	Table 6

Dilution Factors

Receptor	X/Q ($\mu\text{g}/\text{m}^3$)/(tons/yr)	X/Qmax ($\mu\text{g}/\text{m}^3$)/(lbs/hr)
Residential	5.665	248.119
Commercial - Worker	5.665	248.119

Adjustment and Intake Factors

	Residential	Worker
Year of Exposure	30	
Combined Exposure Factor (CEF) - Table 9.1 & 9.2	676.63	56.26
Worker Adjustment Factor (WAF) - Table 10	1	1.00

[illegible]

[illegible]

02/28/18

$$\text{MICR Worker} = \text{CP (mg/(kg-day))}^{-1} * \text{Q (ton/yr)} * (\text{X/Q}) \text{ Worker} * \text{CEF Worker} * \text{MP Worker} * \text{WAF Worker} * 1\text{e-6} * \text{MWF}$$

Compound	Residential	Commercial
Particulate Emissions from Diesel-Fueled Engines	5.22E-08	4.34E-09
Total	5.22E-08	4.34E-09
	PASS	PASS

5b. Cancer Burden Calculation?

NO

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max * MWAF] / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MP * MWAF] / Chronic REL

HIC 8-hr = [Q(ton/yr) * (X/Q) * WAF * MWAF] / 8-hr Chronic REL

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL				Pass	Pass	Pass
Bones and teeth - BN				Pass	Pass	Pass
Cardiovascular system - CV				Pass	Pass	Pass
Developmental - DEV				Pass	Pass	Pass
Endocrine system - END				Pass	Pass	Pass
Eye				Pass	Pass	Pass
Hematopoietic system - HEM				Pass	Pass	Pass
Immune system - IMM				Pass	Pass	Pass
Kidney - KID				Pass	Pass	Pass
Nervous system - NS				Pass	Pass	Pass
Reproductive system - REP				Pass	Pass	Pass
Respiratory system - RES		1.40E-05		Pass	Pass	Pass
Skin				Pass	Pass	Pass

$$\text{HIA} = [\text{Q}(\text{lb/hr}) * (\text{X/Q})_{\text{max resident}} * \text{MWAFF}] / \text{Acute REL}$$

Tier 3 Report -
Appendix C - PAR 1146 series Rule1401_Excel

6a. Hazard Index Acute - Worker

A/N: 3 1146 series/PR 1

Application deemed complete date: 02/28/18
$$HIA = [Q(\text{lb/hr}) * (X/Q)_{\text{max Worker}} * M\text{WAF}] / \text{Acute REL}$$
[illegible]

$$\text{HIC} = [\text{Q}(\text{ton/yr}) * (\text{X/Q}) \text{ Resident} * \text{MP Chronic Resident} * \text{MWAf}] / \text{Chronic REL}$$

Tier 3 Report -
Appendix C - PAR 1146 series Rule1401_Excel

$$\text{HIC} = [\text{Q(ton/yr)} * (\text{X/Q}) * \text{MP Chronic Worker} * \text{MWAF}] / \text{Chronic REL}$$

Tier 3 Report -
Appendix C - PAR 1146 series Rule1401_Excel

A/N: 3 1146 series/PR 1

Application deemed complete date: 02/28/18

Particulate Emissions from Diesel-Fueled Engines

[illegible]

$$\text{HIC 8-hr} = [\text{Q(ton/yr)} * (\text{X/Q})_{\text{Worker}} * \text{WAF Worker} * \text{MWAF}] / \text{8-hr Chronic REL}$$

Tier 3 Report -
Appendix C - PAR 1146 series Rule1401_Excel

APPENDIX D

List of Affected Facilities

Appendix D - List of Affected Facilities

Facility ID	NAICS	Facility Name	Addresss	City	Zip Code	Distance from School (meters)	Distance from Sensitive Receptor (meters)	Airport within 2 miles (code)
1744	339991	KIRKILL - TA COMPANY	'300 E CYPRESS ST'	'BREA'	'92821'	226.691145	226.691145	None
2946	332111	PACIFIC FORGE INC	'10641 S ETIWANDA AVE'	'FONTANA'	'92337'	2613.068272	979.178563	No
3029	313310	MATCHMASTER DYEING & FINISHING INC	'3700 S BROADWAY'	'LOS ANGELES'	'90007'	185.162556	185.162556	No
3721	326140	DART CONTAINER CORP OF CALIFORNIA	'150 S MAPLE ST'	'CORONA'	'92880'	1079.852043	552.870892	AJO
7416	325120	PRAXAIR INC	2300 E Pacific Coast Hwy	Wilmington	90744	662.93	486.7	No
9053	221330	VEOLIA ENERGY LA INC	'715 W 3RD ST'	'LOS ANGELES'	'90071'	91.344122	91.365569	No
11435	325180	PQ CORPORATION	'8401 QUARTZ AVE'	'SOUTH GATE'	'90280'	702.266596	268.00519	No
11716	324122	FONTANA PAPER MILLS INC	'13733 VALLEY BLVD'	'FONTANA'	'92335'	2268.048452	171.274817	No
12155	327120	ARMSTRONG FLOORING INC	'5037 PATATA ST'	'SOUTH GATE'	'90280'	506.788349	130.959011	No
14871	322130	SONOCO PRODUCTS CO	'166 N BALDWIN PARK BLVD'	'CITY OF INDUSTRY'	'91746'	994.059097	210.764176	No
16642	312120	ANHEUSER-BUSCH LLC., (LA BREWERY)	'15800 ROSCOE BLVD'	'VAN NUYS'	'91406'	835.057126	68.188079	VNY
16978	311611	CLOUGHERTY PACKING LLC/HORMEL FOODS CORP	'3049 E VERNON AVE'	'VERNON'	'90058'	1088.105892	952.759975	No
18294	336411	NORTHROP GRUMMAN SYSTEMS CORP	'1 HORNET WAY'	'EL SEGUNDO'	'90245'	158.650812	220.213202	LAX
20604	445110	RALPHS GROCERY CO	'1100 W ARTESIA BLVD'	'COMPTON'	'90220'	839.733298	581.684577	CPM
21887	322121	KIMBERLY-CLARK WORLDWIDE INC.-FULT. MILL	'2001 E ORANGETHORPE AVE'	'FULLERTON'	'92831'	789.30447	789.30447	No
22607	311511	CALIFORNIA DAIRIES, INC	'11709 ARTESIA BLVD'	'ARTESIA'	'90701'	390.715734	29.271151	No
35302	324122	OWENS CORNING ROOFING AND ASPHALT, LLC	'1501 N TAMARIND AVE'	'COMPTON'	'90222'	463.401343	125.176889	CPM
40034	314110	BENTLEY PRINCE STREET INC	'14641 DON JULIAN RD'	'CITY OF INDUSTRY'	'91746'	1123.353786	548.202724	No
42775	211120	WEST NEWPORT OIL CO	'1080 W 17TH ST'	'COSTA MESA'	'92627'	427.738892	427.738892	No
45746	322130	PABCO BLDG PRODUCTS LLC,PABCO PAPER, DBA	'4460 PACIFIC BLVD'	'VERNON'	'90058'	150.187684	265.732837	No
46268	332996	CALIFORNIA STEEL INDUSTRIES INC	'14000 SAN BERNARDINO AVE'	'FONTANA'	'92335'	1240.558978	301.937964	No
47781	221112	OLS ENERGY-CHINO	'5601 EUCALYPTUS AVE'	'CHINO'	'91710'	1547.777108	545.697929	No
51620	221112	WHEELABRATOR NORWALK ENERGY CO INC	'11500 BALSAM ST'	'NORWALK'	'90650'	801.481249	278.216095	No
59618	313310	PACIFIC CONTINENTAL TEXTILES, INC.	'2880 E ANA ST'	'COMPTON'	'90221'	899.205104	777.589021	No
74424	812331	ANGELICA TEXTILE SERVICES	'451 SAN FERNANDO RD'	'LOS ANGELES'	'90031'	737.710065	184.873323	No
85943	331315	SIERRA ALUMINUM COMPANY	'11806 PACIFIC AVE'	'FONTANA'	'92337'	1775.81116	721.210627	No
94872	332431	METAL CONTAINER CORP	'10980 INLAND AVE'	'MIRA LOMA'	'91752'	2353.193089	610.55285	No
94930	325411	CARGILL INC	'566 N GILBERT ST'	'FULLERTON'	'92833'	860.57814	833.724772	FUL
95212	314110	FABRICA	'3201 S SUSAN ST'	'SANTA ANA'	'92704'	431.230818	567.955494	No
96587	313310	TEXOLINI INC	'2575 EL PRESIDIO ST'	'CARSON'	'90810'	848.422563	370.087676	No
126498	332812	STEELSCAPE, INC	'11200 ARROW ROUTE'	'RANCHO CUCAMONGA'	'91730'	955.489675	600.330023	No
129816	221112	INLAND EMPIRE ENERGY CENTER, LLC	26226 Antelope Rd	Menifee	92585	561.14	379.92	No
131732	334413	NEWPORT FAB, LLC	'4321 JAMBOREE RD'	'NEWPORT BEACH'	'92660'	1959.701781	175.23393	SNA
131850	314110	SHAW DIVERSIFIED SERVICES INC	'15305 VALLEY VIEW AVE'	'SANTA FE SPRINGS'	'90670'	715.276411	531.854	No
132068	311812	BIMBO BAKERIES USA INC	'480 S VAIL AVE'	'MONTEBELLO'	'90640'	202.680654	97.841097	No
143741	211120	DCOR LLC	'OFFSHORE PLATFORM EDITH OCS P-0296'	'HUNTINGTON BEACH'	'92649'	3337.078783	3337.078783	No
153199	445110	THE KROGER CO/RALPHS GROCERY CO	'850 S CYPRESS ST'	'LA HABRA'	'90631'	584.935273	584.935273	No
155877	312120	MILLERCOORS, LLC	'15801 E 1ST ST'	'IRWINDALE'	'91706'	1704.567652	1536.512685	No
157363	322211	INTERNATIONAL PAPER CO	'601 E BALL RD'	'ANAHEIM'	'92805'	407.25317	160.138019	No
165192	336411	TRIUMPH AEROSTRUCTURES, LLC	'3901 JACK NORTHROP AVE'	'HAWTHORNE'	'90250'	566.467157	256.178135	HHR

Facility ID	NAICS	Facility Name	Address	City	Zip Code	Distance from School (meters)	Distance from Sensitive Receptor (meters)	Airport within 2 miles (code)
168088	561110	POLYNT COMPOSITES USA INC	'2801 LYNWOOD RD'	'LYNWOOD'	'90262'	457.432456	234.208541	No
172005	322121	NEW- INDY ONTARIO, LLC	'5100 E. JURUPA ST'	'ONTARIO'	'91761'	3465.376352	2589.344122	No
173290	812332	MEDICLEAN	'4500 DUNHAM ST'	'COMMERCE'	'90040'	520.908728	59.730042	No
175154	211120	FREPORT-MCMORAN OIL & GAS	'1400 N MONTEBELLO BLVD'	'MONTEBELLO'	'90640'	1058.68841	425.170951	No
175191	211120	FREPORT-MCMORAN OIL & GAS	'5640 S FAIRFAX AVE'	'LOS ANGELES'	'90056'	802.51926	24.930016	No
180367	211111	LINN OPERATING, INC.	'25121 N SIERRA HWY'	'SANTA CLARITA'	'91321'	1112.471529	1040	No
180410	325211	REICHHOLD LLC 2	'237 S MOTOR AVE'	'AZUSA'	'91702'	1720.970935	1327.100957	No
182049	486910	TORRANCE VALLEY PIPELINE CO LLC	'8044 WOODLEY AVE'	'VAN NUYS'	'91406'	1019.066419	497.745891	VNY
182050	221210	TORRANCE VALLEY PIPELINE CO LLC	'25500 MAGIC MOUNTAIN PKY'	'VALENCIA'	'91355'	1878.250132	723.567081	No
182051	486210	TORRANCE VALLEY PIPELINE CO LLC	'5800 SEPULVEDA BLVD'	'CULVER CITY'	'90230'	305.538785	364.443856	No
183832	313210	AST Textile	'12537 CERISE AVE'	'HAWTHORNE'	'90250'	302.505272	204.23845	HHR
800003	336413	HONEYWELL INTERNATIONAL INC	'2525 W 190TH ST'	'TORRANCE'	'90504'	266.018473	218.345257	No
800066	336419	HITCO CARBON COMPOSITES INC	'1551 W 139TH ST'	'GARDENA'	'90249'	1255.509858	218.630524	No
800113	336412	ROHR, INC.	'8200 ARLINGTON AVE'	'RIVERSIDE'	'92503'	712.380746	156.897548	RAL
800128	486210	SO CAL GAS CO	'12801 TAMPA AVE'	'NORTHRIDGE'	'91326'	385.279812	98.705324	No
800129	486910	SFPP, L.P.	'2359 RIVERSIDE AVE'	'BLOOMINGTON'	'92316'	1586.025824	575.663485	No
800149	325180	US BORAX INC	'300 FALCON ST'	'WILMINGTON'	'90744'	1813.111979	1653.33903	No
800189	713110	DISNEYLAND RESORT	'1313 S HARBOR BLVD'	'ANAHEIM'	'92802'	1142.074833	567.882323	No
800205	522120	BANK OF AMERICA NT & SA, BREA CENTER	'275 VALENCIA AVE'	'BREA'	'92823'	375.757831	1257.829477	No
800371	541511	RAYTHEON SYSTEMS COMPANY - FULLERTON OPS	'1801 HUGHES DR'	'FULLERTON'	'92833'	111.647925	111.647925	FUL
800408	336411	NORTHROP GRUMMAN SYSTEMS	'3301 AVIATION Blvd'	'Lawndale'	'90260'	611.374935	247.165245	No
800409	336411	NORTHROP GRUMMAN SYSTEMS CORPORATION	'1 SPACE PARK BLVD'	'REDONDO BEACH'	'90278'	594.070823	247.263381	No
800416	486110	PLAINS WEST COAST TERMINALS LLC	'692 STUDEBAKER RD'	'LONG BEACH'	'90803'	192.770836	81.089582	No
800417	486110	PLAINS WEST COAST TERMINALS LLC	'2500 E VICTORIA ST'	'COMPTON'	'90220'	1620.207994	411.92426	No
800419	486110	PLAINS WEST COAST TERMINALS LLC	'21652 NEWLAND ST'	'HUNTINGTON BEACH'	'92646'	1046.366079	667.585259	No
800420	486110	PLAINS WEST COAST TERMINALS LLC	'2685 PIER S LN'	'LONG BEACH'	'90802'	2631.099595	1378.478262	No

APPENDIX E

Ammonia Storage Calculations

Hazards Assessment for PARs 1146 series and PR 1100 - SCRs

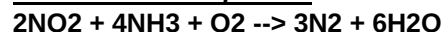
Summary						
Facility	Monthly Aq. NH3 Needed (gal/month)	Sized for Tank	Typical Tank Sizes to Hold NH3 (gallons)	RMP Value (in miles)	Distance (feet)	Significant?
1	401.98	603	1,000	0.2	1056	No
2	214.19	321	500	0.1	528	Yes
3	981.89	1,473	2,000	0.2	1056	No
4	955.22	1,433	2,000	0.2	1056	No
5	1370.37	2,056	3,900	0.3	1584	Yes
6	6455.27	9,683	10,000	0.6	3168	Yes
7	339.99	510	1,000	0.2	1056	No
8	1860.51	2,791	3,900	0.3	1584	No
9	565.23	848	1,000	0.2	1056	Yes
10	1217.88	1,827	2,000	0.2	1056	No
11	1042.07	1,563	2,000	0.2	1056	Yes
12	934.97	1,402	2,000	0.2	1056	Yes
13	566.42	850	1,000	0.2	1056	No
14	1011.43	1,517	2,000	0.2	1056	Yes
15	119.00	178	250	0.1	528	No
16	296.07	444	500	0.1	528	No
17	297.49	446	500	0.1	528	No
18	486.47	730	1,000	0.2	1056	No
19	177.93	267	500	0.1	528	No
20	355.71	534	1,000	0.2	1056	Yes
21	1130.47	1,696	2,000	0.2	1056	No
22	3138.28	4,707	6,565	0.4	2112	No
23	340.33	510	1,000	0.2	1056	Yes
24	420.40	631	1,000	0.2	1056	No
25	690.67	1,036	2,000	0.2	1056	Yes
26	2487.31	3,731	3,900	0.3	1584	No
27	942.90	1,414	2,000	0.2	1056	Yes
28	652.78	979	1,000	0.2	1056	No
29	935.65	1,403	2,000	0.2	1056	Yes
30	1334.57	2,002	3,900	0.3	1584	Yes
31	451.51	677	1,000	0.2	1056	No
32	1211.27	1,817	2,000	0.2	1056	No

Notes:

1. Storage tanks should be sized to hold at least 1.5 times (<https://www.tannerind.com/sto-aqua-ammonia.html>)
2. Tank Size Dimensions (Typical): <https://ammoniatanks.com/>; <https://www.epa.gov/sites/production/files/2013-11/documents/appendix-f1.pdf>
3. RMP*Comp run at 77 degrees F
4. Assume square footage of building enclosure is twice the size of the O.D. and length of the tank

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
1	20.9816	0.0105

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	20.9816	2	0.4561	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.9122	15.5082	1.05	16.2836

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.11	770.17	64.18
Water	H2O	18	81%	4.5	0.80	8.345	11.11	4053.53	337.79
Total	-	-	100%	5.62	1.00	-	13.22	4823.70	401.98

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
2	11.1801	0.0056

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

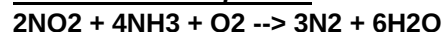
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	11.1801	2	0.2430	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.4861	8.2636	1.05	8.6767

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.12	410.39	34.20
Water	H2O	18	81%	4.5	0.80	8.345	5.92	2159.93	179.99
Total	-	-	100%	5.62	1.00	-	7.04	2570.32	214.19

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
3	51.2510	0.0256

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	51.2510	2	1.1142	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.2283	37.8812	1.05	39.7753

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.15	1881.27	156.77
Water	H2O	18	81%	4.5	0.80	8.345	27.13	9901.41	825.12
Total	-	-	100%	5.62	1.00	-	32.28	11782.68	981.89

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
4	49.8591	0.0249

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

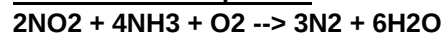
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	49.8591	2	1.0839	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1678	36.8524	1.05	38.6950

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.01	1830.17	152.51
Water	H2O	18	81%	4.5	0.80	8.345	26.39	9632.50	802.71
Total	-	-	100%	5.62	1.00	-	31.40	11462.67	955.22

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
5	71.5283	0.0358

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

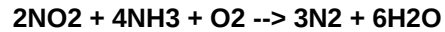
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	71.5283	2	1.5550	-	-	-
Aqueous Ammonia	NH3	17	-	4	3.1099	52.8687	1.05	55.5122

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	7.19	2625.58	218.80
Water	H2O	18	81%	4.5	0.80	8.345	37.86	13818.86	1151.57
Total	-	-	100%	5.62	1.00	-	45.05	16444.44	1370.37

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
6	336.9413	0.1685

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

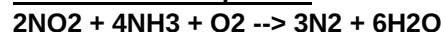
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	336.9413	2	7.3248	-	-	-
Aqueous Ammonia	NH3	17	-	4	14.6496	249.0436	1.05	261.4958

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	33.89	12368.08	1030.67
Water	H2O	18	81%	4.5	0.80	8.345	178.34	65095.13	5424.59
Total	-	-	100%	5.62	1.00	-	212.23	77463.21	6455.27

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
7	17.7462	0.0089

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

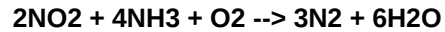
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	17.7462	2	0.3858	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.7716	13.1168	1.05	13.7726

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.78	651.41	54.28
Water	H2O	18	81%	4.5	0.80	8.345	9.39	3428.47	285.71
Total	-	-	100%	5.62	1.00	-	11.18	4079.87	339.99

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
8	97.1120	0.0486

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	97.1120	2	2.1111	-	-	-
Aqueous Ammonia	NH3	17	-	4	4.2223	71.7784	1.05	75.3673

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	9.77	3564.68	297.06
Water	H2O	18	81%	4.5	0.80	8.345	51.40	18761.48	1563.46
Total	-	-	100%	5.62	1.00	-	61.17	22326.16	1860.51

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
9	29.5031	0.0148

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

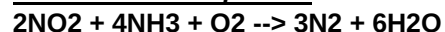
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	29.5031	2	0.6414	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.2827	21.8066	1.05	22.8969

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.97	1082.97	90.25
Water	H2O	18	81%	4.5	0.80	8.345	15.62	5699.82	474.99
Total	-	-	100%	5.62	1.00	-	18.58	6782.79	565.23

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
10	63.5686	0.0318

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

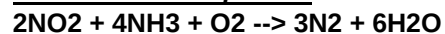
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	63.5686	2	1.3819	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.7639	46.9855	1.05	49.3348

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	6.39	2333.41	194.45
Water	H2O	18	81%	4.5	0.80	8.345	33.65	12281.10	1023.42
Total	-	-	100%	5.62	1.00	-	40.04	14614.51	1217.88

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
11	54.3921	0.0272

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	54.3921	2	1.1824	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.3649	40.2029	1.05	42.2130

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.47	1996.57	166.38
Water	H2O	18	81%	4.5	0.80	8.345	28.79	10508.25	875.69
Total	-	-	100%	5.62	1.00	-	34.26	12504.81	1042.07

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
12	48.8021	0.0244

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

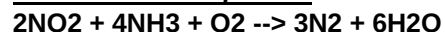
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	48.8021	2	1.0609	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1218	36.0711	1.05	37.8746

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	4.91	1791.37	149.28
Water	H2O	18	81%	4.5	0.80	8.345	25.83	9428.28	785.69
Total	-	-	100%	5.62	1.00	-	30.74	11219.65	934.97

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
13	29.5650	0.0148

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	29.5650	2	0.6427	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.2854	21.8524	1.05	22.9450

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.97	1085.24	90.44
Water	H2O	18	81%	4.5	0.80	8.345	15.65	5711.80	475.98
Total	-	-	100%	5.62	1.00	-	18.62	6797.04	566.42

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
14	52.7930	0.0264

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

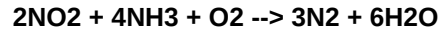
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	52.7930	2	1.1477	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.2953	39.0209	1.05	40.9719

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.31	1937.87	161.49
Water	H2O	18	81%	4.5	0.80	8.345	27.94	10199.30	849.94
Total	-	-	100%	5.62	1.00	-	33.25	12137.16	1011.43

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
15	6.2112	0.0031

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

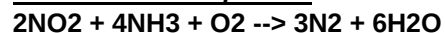
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	6.2112	2	0.1350	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.2701	4.5909	1.05	4.8204

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	0.62	227.99	19.00
Water	H2O	18	81%	4.5	0.80	8.345	3.29	1199.96	100.00
Total	-	-	100%	5.62	1.00	-	3.91	1427.96	119.00

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
16	15.4540	0.0077

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

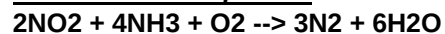
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	15.4540	2	0.3360	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.6719	11.4225	1.05	11.9936

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.55	567.27	47.27
Water	H2O	18	81%	4.5	0.80	8.345	8.18	2985.62	248.80
Total	-	-	100%	5.62	1.00	-	9.73	3552.89	296.07

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
17	15.5279	0.0078

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	15.5279	2	0.3376	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.6751	11.4772	1.05	12.0510

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.56	569.98	47.50
Water	H2O	18	81%	4.5	0.80	8.345	8.22	2999.91	249.99
Total	-	-	100%	5.62	1.00	-	9.78	3569.89	297.49

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
18	25.3919	0.0127

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

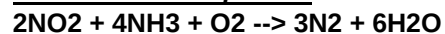
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	25.3919	2	0.5520	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.1040	18.7679	1.05	19.7063

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.55	932.06	77.67
Water	H2O	18	81%	4.5	0.80	8.345	13.44	4905.56	408.80
Total	-	-	100%	5.62	1.00	-	15.99	5837.62	486.47

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
19	9.2872	0.0046

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

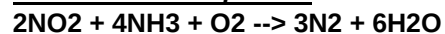
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	9.2872	2	0.2019	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.4038	6.8644	1.05	7.2077

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	0.93	340.90	28.41
Water	H2O	18	81%	4.5	0.80	8.345	4.92	1794.23	149.52
Total	-	-	100%	5.62	1.00	-	5.85	2135.13	177.93

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
20	18.5670	0.0093

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

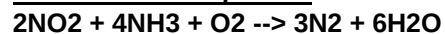
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	18.5670	2	0.4036	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.8073	13.7234	1.05	14.4096

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.87	681.54	56.79
Water	H2O	18	81%	4.5	0.80	8.345	9.83	3587.03	298.92
Total	-	-	100%	5.62	1.00	-	11.69	4268.57	355.71

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
21	59.0061	0.0295

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	59.0061	2	1.2827	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.5655	43.6132	1.05	45.7939

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.93	2165.93	180.49
Water	H2O	18	81%	4.5	0.80	8.345	31.23	11399.65	949.97
Total	-	-	100%	5.62	1.00	-	37.17	13565.58	1130.47

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
22	163.8066	0.0819

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

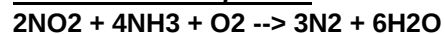
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	163.8066	2	3.5610	-	-	-
Aqueous Ammonia	NH3	17	-	4	7.1220	121.0745	1.05	127.1282

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	16.47	6012.84	501.07
Water	H2O	18	81%	4.5	0.80	8.345	86.70	31646.50	2637.21
Total	-	-	100%	5.62	1.00	-	103.18	37659.34	3138.28

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
23	17.7640	0.0089

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	17.7640	2	0.3862	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.7723	13.1299	1.05	13.7864

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.79	652.06	54.34
Water	H2O	18	81%	4.5	0.80	8.345	9.40	3431.89	285.99
Total	-	-	100%	5.62	1.00	-	11.19	4083.95	340.33

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
24	21.9432	0.0110

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

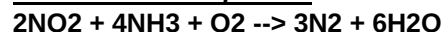
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	21.9432	2	0.4770	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.9541	16.2189	1.05	17.0298

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.21	805.47	67.12
Water	H2O	18	81%	4.5	0.80	8.345	11.61	4239.30	353.27
Total	-	-	100%	5.62	1.00	-	13.82	5044.76	420.40

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
25	36.0503	0.0180

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

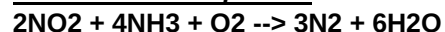
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	36.0503	2	0.7837	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.5674	26.6458	1.05	27.9781

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	3.63	1323.29	110.27
Water	H2O	18	81%	4.5	0.80	8.345	19.08	6964.71	580.39
Total	-	-	100%	5.62	1.00	-	22.71	8288.00	690.67

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
26	129.8283	0.0649

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	129.8283	2	2.8224	-	-	-
Aqueous Ammonia	NH3	17	-	4	5.6447	95.9600	1.05	100.7580

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	13.06	4765.60	397.13
Water	H2O	18	81%	4.5	0.80	8.345	68.72	25082.08	2090.17
Total	-	-	100%	5.62	1.00	-	81.77	29847.68	2487.31

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
27	49.2161	0.0246

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

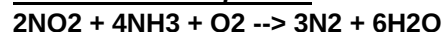
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	49.2161	2	1.0699	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1398	36.3772	1.05	38.1960

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	4.95	1806.57	150.55
Water	H2O	18	81%	4.5	0.80	8.345	26.05	9508.28	792.36
Total	-	-	100%	5.62	1.00	-	31.00	11314.85	942.90

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
28	34.0727	0.0170

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

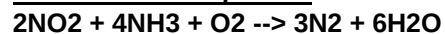
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	34.0727	2	0.7407	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.4814	25.1842	1.05	26.4434

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	3.43	1250.70	104.23
Water	H2O	18	81%	4.5	0.80	8.345	18.03	6582.65	548.55
Total	-	-	100%	5.62	1.00	-	21.46	7833.36	652.78

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
29	48.8376	0.0244

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

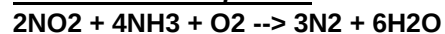
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	48.8376	2	1.0617	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1234	36.0973	1.05	37.9022

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	4.91	1792.68	149.39
Water	H2O	18	81%	4.5	0.80	8.345	25.85	9435.14	786.26
Total	-	-	100%	5.62	1.00	-	30.76	11227.81	935.65

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
30	69.6598	0.0348

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	69.6598	2	1.5143	-	-	-
Aqueous Ammonia	NH3	17	-	4	3.0287	51.4877	1.05	54.0620

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	7.01	2557.00	213.08
Water	H2O	18	81%	4.5	0.80	8.345	36.87	13457.87	1121.49
Total	-	-	100%	5.62	1.00	-	43.88	16014.87	1334.57

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
31	23.5670	0.0118

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

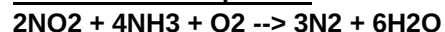
Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	23.5670	2	0.5123	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.0247	17.4191	1.05	18.2900

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.37	865.07	72.09
Water	H2O	18	81%	4.5	0.80	8.345	12.47	4553.00	379.42
Total	-	-	100%	5.62	1.00	-	14.84	5418.07	451.51

Estimated Ammonia Use & Ammonia Tank Sizing**Amount of NOx Reductions Needed**

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
32	63.2238	0.0316

Stoichiometric Equation**Amount of NH3 Needed (lb/day)**

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	63.2238	2	1.3744	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.7489	46.7306	1.05	49.0672

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	6.36	2320.75	193.40
Water	H2O	18	81%	4.5	0.80	8.345	33.46	12214.48	1017.87
Total	-	-	100%	5.62	1.00	-	39.82	14535.23	1211.27

APPENDIX F

CEQA Scoping Comments and Responses to Comments

Introduction

A CEQA scoping meeting was required for the proposed project pursuant to Public Resources Code Section 21083.9(a)(2) and was held at the SCAQMD's Headquarters in conjunction with the Public Workshop on February 14, 2018. One oral, CEQA-related comment was made during the scoping meeting.

Comment #1

Mr. Shawn Tieu from Andeavor inquired about whether the CEQA document will analyze particulate emissions from the ammonia slip that may result from using ammonia in SCR systems to control NOx emissions.

Response to Comment #1

The analysis of ammonia slip can be found in Chapter 4, page 4-~~1946~~ of this Revised Draft SEA.

APPENDIX G

Comment Letters Received on the Original Draft SEA (comment period from April 3, 2018 to May 18, 2018) and Responses to Comments

Comment Letter #1: Shasta Gaughen, Ph.D./Pala Environmental Department

Comment Letter #2: Ray Teran/Viejas Band of Kumeyaay Indians

Comment Letter #3: Richard Vuong/OC Public Works

Comment Letter #4: Oyango A. Snell/Western States Petroleum Association

Comment Letter #1



PALA ENVIRONMENTAL DEPARTMENT
PALA BAND OF MISSION INDIANS
PMB 50, 35008 Pala Temecula Road | Pala, CA 92059
Phone 760-891-3510 | Fax 760-742-3189

April 9, 2018

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178
Attention: Ms. Diana Thai (c/o CEQA)

Re: Recipient of CEQA Notices/Documents

Dear Ms. Thai,

The Pala Band of Mission Indians would like to thank you for the opportunity to review and comment on the SDAPCD's notices related to the California Environmental Quality Act (CEQA). According to your letter the SDAPCD participating as a lead agency on projects is very valuable information for us and we wish to continue receiving more communication from SCAQMD pertaining to CEQA. This letter therefore is to inform you that Pala currently has no objections to receiving more information from SCAQMD. Please keep us on your contacts list.

If you have any questions or comments, please contact Darold Wallick, Air Technician for the Pala Environmental Department, at dwallick@palatribe.com or 760-891-3540.

Sincerely,

Shasta C. Gaughen, PhD
Environmental Director

Response to Comment Letter #1 – Pala Environmental Department

Thank you for your comment. No further response is required under CEQA.

Comment Letter #2



P.O. Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

April 9, 2018

Barbara Radlein
Program Supervisor
South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765

Re: Emissions of Oxides of Nitrogen

Dear Ms. Radlein,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Ray Teran".

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

Response to Comment Letter #2 – Viejas Band of Kumeyaay Indians

The comment received from Mr. Ray Teran indicates the proposed project would have little cultural significance or ties to the Viejas Band of Kumeyaay Indians. Mr. Teran has suggested staff contact the Tribe(s) closest to cultural resources about the proposed project and asked to be informed of any new developments. Staff notified all of the tribes on the Tribal Consultation List as provided by the Native American Heritage Commission of the availability of the original Draft SEA. After the comment period for the original Draft SEA ended, SCAQMD staff revised the project description and environmental analysis and prepared this Revised Draft SEA to reflect these changes. The Revised Draft SEA has been released for a 45-day public comment and review period. As part of the recirculation process, the staff has also notified all of the tribes on the list of the availability of the Revised Draft SEA.

Comment Letter #3



April 26, 2018

NCL-18-021

Diana Thai
c/o CEQA
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Subject: Proposed Amended Rules 1146 Series and Adoption of Rule 1100

Dear Ms. Thai:

The County of Orange has reviewed the Draft Subsequent Environmental Assessment (SEA) for the Proposed Amended Rules 1146 Series and Adoption of Rule 1100 and has no comments at this time. We would like to be advised of any further developments on the project. Please continue to keep us on the distribution list for future notifications related to the project.

If you have any questions, please contact John Fyne-Nsofor in Development Services at (714) 667-8870.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Richard Vuong', is written over a blue circular stamp.

Richard Vuong, Manager, Planning Division
OC Public Works Service Area/OC Development Services
300 North Flower Street
Santa Ana, California 92702-4048
Richard.Vuong@ocpw.ocgov.com

Response to Comment Letter #3 – OC Public Works

Thank you for your comment. Staff has also sent a notification regarding the availability of the Revised Draft SEA. Staff will continue to keep OC Public Works on the distribution list for future notifications related to the project. No further response is required under CEQA.

Comment Letter #4



Western States Petroleum Association
Credible Solutions • Responsive Service • Since 1907

Oyango A. Snell, Esq.
General Counsel

May 1, 2018

Dr. Philip Fine
Deputy Executive Officer, Planning and Rules
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Via e-mail at: pfine@aqmd.gov

Re: WSPA concerns with Proposed Amended Rules 1146, 1146.1 and 1146.2 and RECLAIM Landing Rules

Dear Dr. Fine:

Western States Petroleum Association (WSPA) appreciates the ability to participate in working groups related to the transition of the Regional Clean Air Incentives Market (RECLAIM) program and Proposed Amended Rules (PAR) 1146, 1146.1 and 1146.2 and the opportunity to make comments. WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in five western states including California. WSPA has been an active participant in air quality planning issues for over 30 years. WSPA-member companies operate petroleum refineries and other facilities in the South Coast Air Basin that are within the purview of the RECLAIM Program administered by the South Coast Air Quality Management District (AQMD or District).

PAR 1146, 1146.1 and 1146.2 represent essential "landing rules" which, if adopted, would apply to many WSPA member and non-member facilities which stand to be transitioned from RECLAIM's market-based structure into new command-and-control Best Available Retrofit Control Technology (BARCT) requirements. We have several comments and concerns with the District's current proposals for these PARs.

1. Staff has not conducted a BARCT assessment for the boilers, steam generators, or process heaters at facilities that would be transitioning from RECLAIM under PAR 1146, 1146.1 and 1146.2.

State law defines BARCT as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." (Health & Saf. Code § 40406). Under the current proposal, District Staff has not conducted a BARCT assessment for boilers, steam generators, or process heaters located at facilities transitioning from RECLAIM to command and control. Rather, the current Staff proposal would simply extend the requirements of existing Rules 1146, 1146.1 and 1146.2 to this large number of facilities. These RECLAIM facilities were not part of the universe of facilities or equipment considered when the District adopted the BARCT requirements currently found in Rules 1146, 1146.1, or 1146.2. Therefore, the District has not analyzed the environmental, energy, and economic impacts for the entire class or category of source. The District cannot simply extend existing requirements to a new universe of facilities and equipment without first conducting new (or supplementary)

4-1

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Comment Letter #4 (continued)

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BARCT determinations to demonstrate that proposed emission limitations and/or other requirements are both technically feasible and cost effective. Such a demonstration is required under California Health & Safety Code Section 40406.

RECLAIM facilities have been subject to market-based emissions control requirements since 1994. For this reason, the boilers, steam generators, and process heaters at these facilities will widely vary in terms of their physical configurations (e.g., basic equipment, emissions controls) and their emissions performance. Furthermore, many of the compliance requirements (e.g., averaging periods) in these rules differ from RECLAIM and cannot readily be applied to RECLAIM equipment and facilities. It is inappropriate to assume that the BARCT requirements, and supporting technical feasibility and cost effectiveness analyses, can apply equally and equitably to facility equipment that was not part of the original BARCT analysis. The District needs to demonstrate that those requirements or alternative BARCT requirements are both technically feasible and cost effective for this new group of facilities being transitioned from RECLAIM where they have operated for two plus decades.

4-1
cont.

2. The environmental and socioeconomic impacts for PAR 1146, 1146.1 and 1146.2 should be considered in CEQA and Socioeconomic Assessments for the entire RECLAIM Transition Project.

Under the California Environmental Quality Act (CEQA), CEQA Guidelines and SCAQMD Rule 110, the SCAQMD Governing Board (as the lead agency under its certified regulatory program) is required to identify and evaluate environmental impacts of its rulemaking activities, as well as feasible means and alternatives to reduce, avoid or eliminate significant impacts. More specifically, “an accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR.” (*County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.) The entire project being proposed must be described in the EIR, and the project description must not minimize project impacts. (*City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438, 1450.) Furthermore, CEQA forbids piecemealing¹ and the Court has explicitly found that it is inappropriate to divide a project into small segments in order to avoid preparing an EIR. (*Bozung v. Local Agency Formation Com.* (1975) 13 Cal.3d 263, 283-284.)

4-2

The California Supreme Court has also held that EIRs may need to address future environmental effects of a proposed project. In *Laurel Heights I*, the court set forth the standards for determining whether reasonably foreseeable future activities must be included in an EIR project description and for determining whether the impacts of those activities must be analyzed in the EIR:

“We hold that an EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects.” (*Laurel Heights Improvement Assn. v. Regents of the University of California (“Laurel Heights I”)* (1988) 47 Cal.3d 376, 396.)

¹ “Piecemealing” or “segmenting” means dividing a project into two or more pieces and evaluating each piece in a separate environmental document. The rule of forbidding piecemealing arises from the definition of “project” under CEQA, where “project” is defined as “the whole of an action.” (14 Cal. Code Regs. § 15378(a).)

Comment Letter #4 (continued)

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As previously noted, PAR 1146, 1146.1 and 1146.2 are part of the District's larger effort to transition RECLAIM program facilities from RECLAIM's market-based design to a command-and-control design. This has been described to the Working Group, and documented in the District's staff report:

"The proposed amendments in Rules 1146, 1146.1 and 1146.2 initiate the transition of the NOx RECLAIM program to a command-and-control regulatory structure."²

This transition is also noted in the District's preliminary environmental assessment, which was drafted for compliance with the California Environmental Quality Act (CEQA):

"As a result of control measure CMB-05 from the 2016 AQMP and ABs 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NOx RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. SCAQMD has begun this transition process by proposing amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters. Proposed Amended Rules (PAR) 1146, 1146.1, and 1146.2 (collectively referred to herein as the PAR 1146 series) will be the first set of rules to be amended to initiate the transition of equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving BARCT."³

4-2
cont.

We believe the District needs to prepare an environmental assessment that considers the entire RECLAIM Transition Project, its rulemakings and its other associated components, across impacted facilities and equipment. While the District prepared a Final Program Environmental Impact Report (Final Program EIR) regarding the 2016 AQMP (certified in March 2017), the analysis focused solely on the implementation of CMB-05. CMB-05 was a general directive from the 2016 AQMP, requiring an assessment of further NOx reductions from the RECLAIM program. (Final Program EIR for the 2016 Air Quality Management Plan (January 2017) p. 2-17.) More specifically, the Final Program EIR describes CMB-05 as "identif[y]ing a series of approaches, assessments, and analyses *that can be explored* to make the program more effective..." (Emphasis added. Final Program EIR at p. 2-17.) The Final Program EIR lists the control methodology of CMB-05 as "re-examination of the RECLAIM program, including voluntary opt-out and the additional control equipment and SCR/SNCR equipment." (Final Program EIR at p. 4.1-2.) Additionally, the Final Program EIR also sets forth the air quality impact, as it relates to CMB-05, as "potential emissions as a result of construction to install new equipment, generation of ammonia emissions from the operations of SCR/SNCR equipment, and potential air quality and GHG emissions from electricity to operate equipment." (Final Program EIR at p. 4.1-2.) The Final Program EIR never addresses the concept of, much less the impacts related to, sunsetting the RECLAIM program.

As shown above, CMB-05 lacks the specifications set forth in the RECLAIM Transition Project and its rulemakings. More importantly, the RECLAIM Transition Project had not yet even been created when CMB-05 was conceived or evaluated under the Final Program EIR. In fact, the RECLAIM Transition Project is still

² SCAQMD Preliminary Draft Staff Report for Proposed Amended Rule (PAR) 1146, PAR 1146.1, PAR 1146.2 and Proposed Rule 1100, January 2018, see page 3.

³ SCAQMD Draft Subsequent Environmental Assessment for PAR 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and PR 1100 – Implementation Schedule for NOx Facilities, March 2018, page 1-2.

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Comment Letter #4 (continued)

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currently under development on an ongoing basis, as District Staff continues to determine how to approach the applicability of several landing rules and whether some rules will even be included in the Project. Given the Final Program EIR's reliance on general directives like CMB-05 and the RECLAIM Transition Project not yet existing at the time of assessment, the Final Program EIR fails to properly evaluate the potential environmental impacts specifically related to the RECLAIM Transition Project and its rulemakings.

4-2
cont.

As prior amendments to the Regulation XX program were considered under CEQA, we believe the overall group of RECLAIM Transition rulemakings⁴ needs to be collectively considered under CEQA, as well. Rules to advance the RECLAIM Transition Project, including these proposed amendments to the 1146 series rules, should not be adopted and facilities should not be removed from RECLAIM until the District has completed and certified a CEQA assessment that evaluates the entire Project. Undertaking these RECLAIM Transition Project rulemakings in a fragmented manner constitutes a piecemealing of the project, which is explicitly forbidden by CEQA as described above. Given that the 1146 series rules are clearly part of the larger RECLAIM Transition Project, we believe the District's current draft CEQA document is improperly scoped.

Additionally, Health & Safety Code Section 40440.8 requires that "[w]henver the south coast district intends to propose the adoption, amendment, or repeal of a rule or regulation that will significantly affect air quality or emissions limitations, the district . . . shall perform an assessment of the socioeconomic impacts of the adoption, amendment, or repeal of the rule or regulation." (Health & Saf. Code § 40440.8(a)). One of the specific factors that the Board is to take into consideration is the "availability and cost-effectiveness of alternatives to the rule or regulation . . ." (Health & Saf. Code § 40440.8(b)(4)). Health & Safety Code Section 40728.5 sets forth substantively identical requirements for all air districts. Similarly, Health & Safety Code Section 40440.5(c)(3) requires that if an environmental assessment is prepared in connection with a proposal to adopt, amend or repeal any rule or regulation, "the staff report shall also include social, economic, and public health analyses." Stakeholders have not yet seen the District's draft socioeconomic assessment for these proposed rules, but we similarly recommend that the District conduct a program-level socioeconomic assessment that considers the socioeconomic effects of the overall RECLAIM Transition Project, including all associated Regulation XI rulemakings, and the 1146 series rules. This should be completed to support related Governing Board rule adoptions prior to the District transitioning individual RECLAIM facilities out of the program.

4-3

WSPA continues to be concerned that the RECLAIM transition could cause significant negative impacts to Southern California businesses, air quality and the regional economy. Similar to the Final Program EIR described above, the Final Socioeconomic Report for the 2016 AQMP analyzed the socioeconomic impacts for the 2016 AQMP, which focused solely on CMB-05. As discussed above, CMB-05 did not include a transition of the RECLAIM program to a command-and-control scheme like that described in the RECLAIM Transition Project or in the Project's associated rulemakings. Given that fact, the RECLAIM Transition rulemaking proposals cannot rely on the 2016 AQMP's Socioeconomic Assessment to cover the RECLAIM Transition Project.

3. The District needs to resolve critical questions about New Source Review (NSR) requirements and Federal NSR equivalency before transitioning individual RECLAIM facilities out of the program.

Under PAR 1146, 1146.1 and 1146.2, Staff has proposed that RECLAIM facilities covered by these rules would begin to be transitioned out of the RECLAIM program after the rules' adoption. This raises a number of serious concerns due to the lack of transition framework, particularly on the topic of NSR. There remain a number of complex questions (legal and otherwise) over how the District will satisfy EPA requirements to demonstrate equivalency with the Federal NSR program. Since a transition model has not been agreed upon between EPA and

4-4

⁴ At this time, RECLAIM Transition project includes proposed amendments to Regulation XX rules, as well as PAR 301, PAR 1109 and/or PR 1109.1, PAR 1110.2, PAR 1118.1, PAR 1134, PAR 1135, PAR 1146, 1146.1, and 1146.2, and PAR 1147, 1147.1, and 1147.2.

Comment Letter #4 (concluded)

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Page 5

the District, facilities are left with uncertainty regarding their permit transition requirements and how future permit changes will impact their operations. RECLAIM facilities should not be transitioned from the program until SCAQMD has resolved these key NSR issues with EPA.

In light of these important issues, PAR 1146, 1146.1 and 1146.2 are not ready for the Governing Board's consideration. Any scheduled or proposed hearing should be delayed until these issues have been adequately addressed.

Thank you for considering these comments. We look forward to continuing to work with you and your Staff on this rulemaking which is critically important to stakeholders, as well as the regional air quality and economy.

If you have any questions, please contact me at (916) 325-3115, or by email at osnell@wspa.org.

Sincerely,



cc: Cathy Reheis-Boyd, WSPA
Patty Senecal, WSPA
Bridget McCann, WSPA
Wayne Nastri, SCAQMD
Clerk of the Board, SCAQMD

4-4
cont.

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Response to Comment Letter #4 – Western States Petroleum Association

Response to Comment 4-1:

Based on the feedback received on the prior analysis, staff conducted a new BARCT assessment for the boilers, steam generators, and process heaters that took into account equipment at both RECLAIM and non-RECLAIM facilities that will be subject to PAR 1146 and 1146.1. Based on those findings, staff has determined new BARCT recommendations for both RECLAIM and non-RECLAIM equipment. Results of the BARCT assessment, which includes a technology assessment, along with supporting cost-effectiveness analysis and incremental cost-effectiveness played a key role in the BARCT NO_x emission level recommendations that were presented Working Group Meeting #5 on August 2, 2018 and updated rule language was presented at Working Group #6 on August 29, 2018 meeting on updated rule language on August 29th. The recommendations were also presented at a Public Workshop on September 20, 2018. Staff has encouraged facility operators to meet with staff regarding unique facility operations and, to the extent possible, were included in the staff recommendations.

Response to Comment 4-2:

The commentator's suggestion that only one programmatic CEQA document should be prepared because future rule amendments to landing rules, or NSR (Regulation XIII) are related to PARs 1146 series and PR 1100 is incorrect and inconsistent with SCAQMD past practice. SCAQMD past practice in conducting CEQA analyses for rule projects such as PARs 1146 series and PR 1100 is that the project being contemplated undergoes its own CEQA analysis. All SCAQMD rules and regulations are related to each other in that they are adopted and/or amended to meet the clean air goals outlined in the 2016 AQMP. The CEQA document for the 2016 AQMP, the March 2017 Final Program EIR, contains the programmatic analyses of the overall effects of SCAQMD's clean air goals. However, CEQA neither requires the SCAQMD to simultaneously amend every rule that may be affected by a control measure in the 2016 AQMP nor requires one programmatic CEQA document to be prepared that encompasses every rule.

The decision to transition from NO_x RECLAIM into a source-specific command-and-control regulatory structure was approved by the SCAQMD Governing Board as control measure CMB-05 in the 2016 AQMP. CMB-05 is required by the California Health and Safety Code to implement BARCT in the RECLAIM program as well as other stationary sources, which will be completed upon rule amendment or adoption of various landing rules. CMB-05 identifies a series of approaches that can be explored to make the RECLAIM program more effective in ensuring equivalency with command-and-control regulations implementing BARCT and to generate further NO_x emissions reductions at RECLAIM facilities.

CMB-05 specifically contemplates the unwinding of the RECLAIM program (see Appendix IV-A, pp. IV-A-67 to IV-A-71 - <http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-iv-a.pdf>).

Furthermore, the potential environmental impacts associated with the 2016 AQMP, including CMB-05, were specifically analyzed in the March 2017 Final Program EIR. In particular, the March 2017 Final Program EIR addressed the environmental effects of future expansion and other actions of reasonably foreseeable consequences for the RECLAIM Transition project and determined that the overall implementation has the potential to generate adverse environmental

impacts to seven topic areas: air quality; energy; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and transportation. More specifically the March 2017 Final Program EIR evaluated and identified the impacts from the installation and operation of additional control equipment, such as selective catalytic reduction (SCR) equipment, potentially resulting in construction emissions, increased electricity demand, hazards from the additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalyst replacements, as well as changes in traffic patterns and volume. The commentator has not identified any additional impact areas, mitigation, or project alternatives from the RECLAIM Transition project that were excluded from the analysis in the March 2017 Final Program EIR for the 2016 AQMP. In any event, the time to challenge the assessments for the analyses of March 2017 Final Program EIR for the 2016 AQMP relied upon has passed (see Public Resources Code Sections 21167 and 21167.2).

The environmental impacts of the entire RECLAIM Transition project were analyzed in the 2016 AQMP and the associated March 2017 Final Program EIR was a program level analysis. The SCAQMD has and will continue to evaluate each individual RECLAIM Transition rule that is developed pursuant to the 2016 AQMP, to determine if any additional CEQA review is required. This has been consistent with SCAQMD's past practice and is not considered piecemealing.

While PARs 1146 series and PR 1100 are part of SCAQMD's Regulation XX - Regional Clean Air Incentives Market (RECLAIM) and that other landing rules are scheduled to be amended in the future, separate CEQA analyses will be conducted for these future rule amendments. Table G-1 identifies several source-specific landing rules as identified by the SCAQMD in its monthly rule forecast report as scheduled to be undergoing separate, future rule amendments²³ from PARs 1146 series and PR 1100.

²³ SCAQMD, Final Subsequent Environmental Assessment for PARs 2001 and 2002, September 2018, p. 1-6.

Table G-1
Rule Development Forecast for Source-Specific Rules
Affected by NOx RECLAIM Transition

Rule Number	Rule Title	Rule Development Forecast (subject to change)
1109.1	Emissions of Oxides of Nitrogen from Boilers and Process Heaters in Refineries	December 2019
1110.2	Emissions from Gaseous- and Liquid-Fueled Engines	1 st Quarter 2019
1118.1	Control of Emissions from Non-Refinery Flares	December 2018
1134	Emissions of Oxides of Nitrogen from Stationary Gas Turbines	1 st Quarter 2019
1135	Emissions of Oxides of Nitrogen from Electric Power Generating Systems	November 2018
1146	Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	December 2018
1146.1	Emissions of Oxides of Nitrogen from Small Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	
1146.2	Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	
1147	NOx Reductions from Miscellaneous Sources	TBD 2019
1147.1	NOx Reductions from Metal Operations Facilities	TBD 2019
1147.2	NOx Reductions from Aggregate Facilities	TBD 2019
1153.1	Emissions of Oxides of Nitrogen from Commercial Food Ovens	TBD 2019

Key: TBD = to be determined

Pursuant to the SCAQMD's Certified Regulatory Program (CEQA Guidelines Section 15251(l); codified in SCAQMD Rule 110 - the rule which implements the SCAQMD's certified regulatory program), the SCAQMD typically prepares an Environmental Assessment (EA) to evaluate the environmental impacts for rule projects proposed for adoption or amendment. PARs 1146 series and PR 1100, are considered a "rule" project that is subject to CEQA under the SCAQMD's Certified Regulatory Program.

The original and Revised Draft SEA for PARs 1146 series and PR 1100 rely on the previous CEQA analyses in: 1) the Final EAs that were certified for the September 2008 amendments to Rules 1146 and 1146.1 (referred to herein as the September 2008 Final EAs for Rules 1146 and 1146.1); 2) the Final EA that was certified for the May 2006 amendments to Rule 1146.2 (referred to herein as the May 2006 Final EA); and 3) the Final Program EIR that was certified for the March 2017 adoption of the 2016 AQMP (referred to herein as the March 2017 Final Program EIR), which is specifically allowed per CEQA Guidelines Section 15162. The preparation of the original and Revised Draft SEA for PARs 1146 series and PR 1100 in this manner in no way chops up the project into "bite-sized pieces" to avoid CEQA or obscure the effects of the project. To the contrary, both the original and Revised Draft SEA for PARs 1146 series and PR 1100 identify the previous CEQA analyses conducted, which already identified and analyzed significant adverse impacts, so as to not repeat or duplicate the information previously provided. The original and

Revised Draft SEA instead focus on the changes proposed in PARs 1146 series and PR 1100, which transition NOx RECLAIM facilities with applicable equipment units to a command-and-control regulatory structure because BARCT analyses have been conducted for these landing rules.

Also, the March 2017 Final Program EIR for the 2016 AQMP evaluated and identified the impacts from the installation and operation of additional control equipment, which would be the same type of equipment and impacts that would occur under the RECLAIM Transition. Furthermore, the December 2015 Final Program EA for NOx RECLAIM also evaluated and identified the impacts from the installation and operation of additional control equipment to comply with BARCT, which is equivalent to command-and-control requirements. Thus, the environmental impacts analysis of complying with BARCT would be the same whether NOx RECLAIM continued in its present form or if NOx RECLAIM facilities transition to a command-and-control regulatory structure. Thus, even though the RECLAIM transition language was added to the 2016 AQMP, no changes were required to the March 2017 Final Program EIR since the impacts associated with implementing BARCT were already evaluated.

Response to Comment 4-3:

Based on past practice, SCAQMD staff evaluates socioeconomic impacts for all command-and-control rules identified as landing rules, including impacts for the installation and operation of controls, as well as impacts for monitoring, reporting, and recordkeeping requirements. To be published in the forthcoming 30-day package (available October 2018) for the November 2, 2018 Governing Board Set Hearing will be the most recent PAR 1146 Series staff report and draft socioeconomic impact analysis. The Final Socioeconomic Report in the 2016 AQMP includes program-level benefit-cost and macroeconomic impact assessment of proposed and amended rules involving RECLAIM transition, and the socioeconomic impact assessment for all such rules undergo a project-level cost assessment that the Governing Board considers before the proposed rule or amendment is adopted.

Response to Comment 4-4:

Staff has given priority to resolve the NSR issues and are committed to working with the U.S. EPA to ensure a whole and functional NSR program. However, staff disagrees that the BARCT rulemakings that are currently underway in several categories should cease until amendments to the NSR program are adopted. Staff believes that the development and implementation of BARCT NOx emission requirement development and implementation can proceed on a parallel path, because it is possible for facilities to go through NSR permitting under current RECLAIM rules. Furthermore, many emission reduction projects as a result of implementing BARCT would not necessarily trigger NSR. RECLAIM transition framework has been outlined in PARs 2001 and 2002. PAR 2002 will provide an option for facilities to remain in RECLAIM for a limited time until future provisions in Regulation XIII pertaining to NSR are adopted. A facility that elects to remain in RECLAIM can offset NOx emission increases with RTCs, while obtaining offset exemptions for other pollutants, if eligible under Rule 1304 requirements. A facility that elects to exit RECLAIM would temporarily not be allowed access to the internal bank for NOx offsets. There are some RECLAIM facilities that have expressed interest in exiting RECLAIM and these facilities are primarily those that have shut down all of their equipment, but are still considered active facilities. Staff has initiated efforts to resolve NSR (Regulation XIII) and related permitting issue, any future amendments that are proposed to Regulation XIII will be accompanied by a CEQA and socioeconomic analysis.