SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Environmental Assessment for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

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Author:	Barbara Radlein	Air Quality Specialist
Contributors:	Rizaldy Calungcagin	Air Quality Specialist
	James Koizumi	Air Quality Specialist
Reviewed By:	Steve Smith, Ph.D.	Program Supervisor, CEQA
	Joe Cassmassi	Planning and Rules Manager, Planning, Rule Development, and Area Sources
	Gary Quinn, P.E.	Program Supervisor, Planning, Rule Development, and Area Sources
	Kurt Wiese	District Counsel

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EXECUTIVE OFFICER:
BARRY R. WALLERSTEIN, D.Env.

PREFACE

This document constitutes the Final Environmental Assessment (EA) for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters. The Draft EA was released for a 45-day public review and comment period from June 13, 2008 to July 29, 2008. One comment letter was received from the public relative to the Draft EA. This letter along with the responses to comments is included in Appendix E of this document.

To ease in identification, modifications to the document are included as underlined text and text removed from the document is indicated by ~~strikethrough~~. None of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15088.5. Therefore, this document is now a Final EA.

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LIST OF ACRONYMS & TERMS

AB = Assembly Bill
AQMP = Air Quality Management Plan
ATCM = Airborne Toxic Control Measure
BACT = Best Available Control Technology
BARCT = Best Available Retrofit Control Technology
Basin = South Coast Air Basin
CalEPA = California Environmental Protection Agency
Caltrans = California Department of Transportation
CARB = California Air Resources Board
CCR = California Code of Regulations
CEC = California Energy Commission
CEQA = California Environmental Quality Act
CFR = Code of Federal Regulations
CHP = California Highway Patrol
DOT = United States Department of Transportation
DTSC = California Environmental Protection Agency Department of Toxic Substance Control
District = South Coast Air Quality Management District
EA = Environmental Assessment
EIR = Environmental Impact Report
EPA = United States Environmental Protection Agency
FR = Federal Register
GHG = Greenhouse Gases
HAP = Hazardous Air Pollutant
HI = Hazard Index
HSC = Health and Safety Code
HSWA = Hazardous and Solid Waste Act
HWCL = Hazardous Waste Control Law
lbs = pounds
MDAB = Mojave Desert Air Basin
mmBTU/hr = million British Thermal Units per hour
mmcf = million standard cubic feet
MSDS = Material Safety Data Sheet
MW = Megawatt
NAAQS = National Ambient Air Quality Standards
NESHAP = National Emission Standard for Hazardous Air Pollutants
NFC = National Fire Code
NOC = Notice of Completion
NOP/IS = Notice of Preparation/Initial Study
NOx = Oxides of Nitrogen
OCA = Off-site Consequence Analysis
OEHA = Office of Environmental Health Hazard Assessment
OSHA = Occupational Safety and Health Administration
PAR = Proposed Amended Rule

PM2.5 = Particulate Matter with an Aerodynamic Diameter of 2.5 microns or less
PM10 = Particulate Matter with an Aerodynamic Diameter of 10 microns or less
RATA = Relative Accuracy Test Audits
RCPG = Regional Comprehensive Plan Guide
RCRA = Resource Conservation and Recovery Act
RECLAIM = Regional Clean Air Incentives Market
REL = Reference Exposure Level
RMP = Risk Management Programs
RTC = RECLAIM Trading Credit
RWQCB = Regional Water Quality Control Board
SARA = Superfund Amendments and Reauthorization Act
SB = Senate Bill
SCAG = Southern California Association of Governments
SCAQMD = South Coast Air Quality Management District
SCR = Selective Catalytic Reduction
SEA = Supplemental Environmental Assessment
SIP = State Implementation Plan
SNCR = Selective Non-Catalytic Reduction
SOx = Oxides of Sulfur
SSAB = Salton Sea Air Basin
TAC = Toxic Air Contaminant
USC = United States Code
USPS = United States Postal Service
VOC = Volatile Organic Compounds

CHAPTER 1

EXECUTIVE SUMMARY

INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin referred to herein as the district. By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all federal and state ambient air quality standards for the district[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[3]. The 2007 AQMP concluded that major reductions in emissions of volatile organic compounds (VOCs), oxides of sulfur (SOx) and oxides of nitrogen (NOx) are necessary to attain the air quality standards for ozone (the key ingredient of smog) and particulate matter (PM10 and PM2.5). Ozone, a criteria pollutant, is formed when VOCs react with NOx in the atmosphere and has been shown to adversely affect human health and to contribute to the formation of PM10 and PM2.5.

Adopted in September 1988, Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, applies to most boilers, steam generators and process heaters with a rated heat input capacity greater than or equal to five million British Thermal Units per hour (mmBTU/hr) and are used in industrial, institutional, and commercial operations. However, Rule 1146 does not regulate NOx emissions from electric utility boilers, petroleum refinery boilers and process heaters with a rated heat input capacity greater than 40 mmBTU/hr, sulfur plant reactor boilers, waste heat recovery boilers serving combustion turbines, and an unfired waste heat recovery boiler that is used to recover heat from the exhaust of any combustion equipment as NOx emissions from these equipment are regulated by other stationary source rules or Regulation XX – Regional Clean Air Incentives Market (RECLAIM).

The primary objective of PAR 1146 is to obtain further NOx emission reductions by implementing the 2007 AQMP Control Measure CM#2007MCS-01: Facility Modernization, by requiring affected facility operators to modernize affected permitted equipment to be retrofitted with Best Available Retrofit Control Technology (BARCT). Another objective of PAR 1146 is to comply with all feasible measures specified in the July 2006 demonstration to the United States Environmental Protection Agency (EPA) that SCAQMD's current air pollution rules fulfill the 8-hour ozone Reasonably Available Control Technology (RACT) standards. The third objective of PAR 1146 is to satisfy the all feasible measures requirements in Senate Bill 656 (SB 656) codified in California Health and Safety Code §39614. In response to SB 656, the California Air Resources Board (CARB) in coordination with local air districts has developed a list of the most readily available, feasible, and cost-effective control measures that could be employed to reduce particulate matter emissions (i.e., PM10 and PM2.5, collectively referred to as PM). SCAQMD staff identified four control measures on the CARB list that may be applicable to the district relative to SB 656 requirements. In particular, SCAQMD staff identified requirements in another air district's rule (San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4306) that appear to be more stringent than those in SCAQMD's existing rules for the category of boilers, steam generators, and process heaters.

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

To achieve the aforementioned objectives, PAR 1146 proposes to reduce the allowable NOx emission limits for boilers, steam generators and process heaters from 30 ppm to 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. PAR 1146 also proposes NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes are proposed that include: 1) establishing a weighted average formula for dual fueled co-fired units; 2) allow existing units to be de-rated to no less than two million BTU 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.

Other minor changes are proposed to improve organization, clarity and consistency throughout the rule. PAR 1146 is estimated to reduce approximately 1.17 tons per day of NOx emissions by 2016. Despite this projected environmental benefit to air quality, the Notice of Preparation/Initial Study (NOP/IS), prepared pursuant to the California Environmental Quality Act (CEQA), identified "air quality" during construction activities and "hazards and hazardous materials" during operational activities as the only areas that may be adversely affected by the proposed project. Impacts to these environmental areas were further analyzed in this Final ~~Draft~~ EA. Details describing the currently proposed project are discussed in Chapter 2 - Project Description, of this Final ~~Draft~~ EA.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PAR 1146 is considered a "project" as defined by CEQA. CEQA requires that the 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's 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 when an impact is significant.

California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The SCAQMD's regulatory program was certified by the Secretary of Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110. Pursuant to Rule 110 (the rule which implements the SCAQMD's certified regulatory program), SCAQMD has prepared this Final ~~Draft~~ Environmental Assessment (EA) to evaluate potential adverse impacts from the proposed project.

The SCAQMD as Lead Agency for the proposed project, prepared a Notice of Preparation/Initial Study (NOP/IS) which identified environmental topics to be analyzed in this document. The NOP/IS provided information about the proposed project to other public agencies and interested parties prior to the release of the~~is~~ Draft EA. The NOP/IS was distributed to responsible agencies and interested parties for a 30-day review and comment period from January 31, 2008, to February 29, 2008. The initial evaluation in the NOP/IS identified the topics of "air quality" and "hazards and hazardous materials" as potentially being adversely affected by the proposed project. During that public comment period, the SCAQMD received one comment letter. The

letter and its response can be found in Appendix D of this document. In addition, the NOP/IS, is attached to this EA as Appendix C, and can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/documents/2008/aqmd/is_nop/1146.pdf

The Draft EA was released for a 45-day public review and comment period from June 13, 2008 to July 29, 2008. One comment letter was received during the public comment period on the analysis presented in the Draft EA. This comment letter along with the responses to comments is included in Appendix E of this document. Thus, this Final ~~Draft~~ EA, prepared pursuant to CEQA, identifies air quality and hazards and hazardous materials as areas that may be adversely affected by the proposed project. Based on the conclusions in the NOP/IS prepared for the proposed project, this Final ~~Draft~~ EA further analyzes whether or not the potential air quality and hazard/hazardous materials impacts are significant.

~~Any comments received during the public comment period on the analysis presented in this Draft EA will be responded to and included in the Final EA.~~ Prior to making a decision on the proposed amendments to Rule 1146, the SCAQMD Governing Board must review and certify the Final EA as providing adequate information on the potential adverse environmental impacts of the proposed amendments to Rule 1146.

PREVIOUS CEQA DOCUMENTATION FOR RULE 1146

This Final ~~Draft~~ EA is a comprehensive environmental document that analyzes potential environmental impacts from PAR 1146. 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, lack of progress in advancing the effectiveness of control technologies to comply with requirements in technology forcing rules, etc.). Several previous environmental analyses have been prepared to analyze past amendments to Rule 1146. The following paragraphs summarize these previously prepared CEQA documents and are included for informational purposes only. This~~e current draft~~ Final EA focuses on the currently proposed amendments to Rule 1146 and does not rely on these previously prepared CEQA documents. The following documents can be obtained by submitting a Public Records Act request to the SCAQMD's Public Records Unit. In addition, a link for downloading files from the SCAQMD's website is provided for those CEQA documents prepared after January 1, 2000. The following is a summary of the contents of these documents.

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 purpose of the November 2000 amendments to Rule 1146 was to: 1) reduce the emission limit for gaseous fueled units to 30 ppm NOx; 2) reduce the emission limit for dual-fueled units to 30 ppm NOx or an average of 30 and 40 ppm NOx weighted by fuel use; and, 3) add 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 reduction benefit of approximately 90 tons of NOx per year was estimated to result from implementation of the November 2000 amendments.

The November 2000 amendments were reviewed pursuant to CEQA Guidelines §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 proposed project in question had the potential to have a significant adverse effect on the environment. Therefore, the SCAQMD determined that the

November 2000 version of Rule 1146 was exempt from CEQA pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/notices/2000/noe/1146noe.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 1, 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. No comments were received relative to the Draft EA. After circulation of the Draft EA, a Final EA was prepared and 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/ceqa/documents/2000/aqmd/finalEA/1146fea.doc.

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; April 1994: The purpose of the May 1994 amendments to Rule 1146 was to: 1) add a tune-up procedure for natural draft boilers; 2) add 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) add a provision to exempt units from tune-up requirements provided that they are not in use during the entire calendar year; 4) delete the Alternate Emission Control Plan (AECP) provision since rule compliance dates have expired; and 5) extend the applicability of the rule to include solid fuels.

The May 1994 amendments to Rule 1146 were reviewed pursuant to CEQA Guidelines §15061(b)(3) and were determined to not have a significant adverse impact on the environment. Further, the May 1994 amendments to Rule 1146 were determined to be categorically exempt from CEQA pursuant to CEQA Guidelines §15308 – Actions by Regulatory Agencies for Protection of the Environment and CEQA Guidelines §15321 – Enforcement Actions by Regulatory Agencies such that a Notice of Exemption was prepared.

Final Supplemental Environmental Impact Report: Proposed Amendment 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. A Statement of Findings and Overriding Considerations were prepared 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; March 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 was prepared for Rule 1146 and was circulated for a 45-day public review and comment period. A Statement of Overriding Considerations was prepared 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 §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 Final ~~Draft~~ EA 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 §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 EA 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.

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 PAR 1146, they could possibly rely on this EA during their decision-making process. Similarly, other single purpose public agencies approving projects at facilities complying with PAR 1146 may rely on this EA.

AREAS OF CONTROVERSY

CEQA Guidelines §15123(b)(2) requires a public agency to identify the areas of controversy in the CEQA document, including issues raised by agencies and the public. Over the course of developing PAR 1146, the predominant concerns expressed by representatives of industry and environmental groups, either in public meetings or in written comments, regarding the proposed project are highlighted in Table 1-1.

Table 1-1
Areas of Controversy

	Area of Controversy	Topics Raised by Public	SCAQMD Evaluation
1.	New or modified Group III units that already comply with current NOx limit of 12 ppm prior to proposed rule amendment	Owners/operators who recently replaced older equipment with new, compliant equipment, or modified equipment to comply with current BACT at 12 ppm, would be unfairly required to replace or retrofit equipment so soon after installation when compared to other, older, dirtier equipment subject to Rule 1146.	PAR 1146 has been revised to allow owners/operators of Group III equipment to defer compliance with the 9 ppm NOx limit (or 0.011 lb NOx/mmBTU for natural gas fired units) until the next time when the unit's burners are replaced. [paragraph (c)(7)]

Table 1-1
Areas of Controversy (concluded)

	Area of Controversy	Topics Raised by Public	SCAQMD Evaluation
2.	Health facilities complying with seismic safety requirements	The timeline when owners/operators of health facilities are required to comply with seismic safety requirements pursuant to Health & Safety Code §§130060 and 130061.5 conflicts with the timeline for when they would have to comply with the lowered NOx limits proposed in PAR 1146.	PAR 1146 has been revised to synchronize with the compliance timelines allowed by the Health & Safety code provided that the owners/operators of the affected health facilities submit a compliance plan by January 1, 2010. [paragraph (e)(5)]
3.	Meteorological factors and achieving proposed NOx limits	The proposed 9 ppm NOx limit should not apply to atmospheric units because compliance can vary and be influenced by ambient temperature, humidity, windspeed and gas quality.	PAR 1146 has been revised to reflect NOx limit of 12 ppm for atmospheric Group III units. [subparagraph (c)(1)(E)]
4.	Boiler tuning requirements, compliance testing & compliance determinations	Requiring an emission determination no later than 1 month or 250 operating hours after a boiler has been tuned is overly restrictive.	This provision in PAR 1146 does not require source tests to be conducted every 250 hours or 30 days. In recognition of events outside the owner or operator's control, PAR 1146 has been revised to include procedures and criteria for conducting unscheduled repairs during compliance determinations. [paragraph (d)(2)] PAR 1146 has also been revised to allow the owner or operator 72 hours to correct any problems that resulted in a non-compliance status. [paragraph (d)(10)]
5.	Energy efficiency, increased operational burden, and greenhouse gas emissions	Requiring burner retrofits will cause a loss of efficiency, increased operational burden and increased emissions of greenhouse gases	According to ultra-low NOx burner vendors and installers, there may be a marginal loss in fuel efficiency which may result in an increase of approximately one to two percent in fuel usage with these burners. In the Air Quality section (Chapter 4) of this Final ~~Draft~~ EA, the loss in fuel efficiency and the corresponding increase in criteria pollutant and greenhouse gas emissions has been estimated and analyzed. Any increase in operational burden will be part of the cost-effectiveness analysis presented in the staff report for PAR 1146.

Note that a discussion of the existing setting for greenhouse gases (GHGs) can be found in Chapter 3 of this document. Further, the air quality section of Chapter 4 also addresses GHG impacts from PAR 1146.

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

Of the topics discussed to address the concerns raised, relative to the secondary air quality impacts that would be associated with implementing the project as proposed due to construction and operational activities for the purposes of CEQA, to date, no other controversial issues were raised as a part of developing PAR 1146.

EXECUTIVE SUMMARY

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

Summary of Chapter 1 – Executive Summary

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

Summary of Chapter 2 - Project Description

The following is a summary of the key proposed amendments to Rule 1146. Other minor changes are also proposed to improve organization, clarity and consistency throughout the rule. A copy of the proposed amended rule can be found in Appendix A.

- Add the following new definitions: "atmospheric unit," "Group I unit," "Group II unit," "Group III unit," "health facility," "school," and "thermal fluid heater;"
- Allowing a later compliance date for health facilities complying with seismic safety requirements;
- Continue the 30 ppm NOx emission limits for several equipment rating categories of boilers, steam generators, and process heaters until the applicable new limit commences;
- Exempt thermal fluid heaters from any proposed NOx limits;
- Clarify the formula for calculating the weighted average to be based on the appropriate compliance limit and heat input for each fuel used, for dual fuel co-fired units;
- Add requirements for operators of any unit with an annual heat input less than or equal to nine mmBTU (90,000 therms) to keep records for a rolling 24-month period for unit operators that choose to select the tune-up option for verifying compliance;

- Require compliance with a 30 ppm NOx limit for low fuel usage equipment by January 1, 2015 or burner replacement, whichever occurs later;
- Clarify the tune-up procedures for consistency throughout the rule;
- Add a requirement for operators to conduct an emissions compliance determination at least every 250 operating hours or 30 days subsequent to the tuning or servicing of a unit, unless it is an unscheduled repair;
- Add a requirement for emission checks via a portable analyzer to be conducted on a monthly basis or every 750 unit operating hours, whichever occurs later;
- Clarify an existing requirement for the use of either a continuous in-stack NOx monitor or equivalent verification system for units with a rated heat input capacity greater than or equal to 40 mmBTU/hr and an annual heat input greater than 200,000 mmBTU that are required to demonstrate initial compliance with the applicable NOx emission concentration limit;
- Add standard compliance limits and schedules for various equipment ratings and fuels burned;
- Establish a staged compliance schedule over a multi-year period which varies by equipment size range and unit operation;
- Add optional enhanced compliance dates for Group II equipment to account for the possibility that certain equipment types and operations may make it difficult for a particular unit to comply with the enhanced option on a continuous basis;
- Clarify that each standard compliance limit and schedule for Group II equipment will allow the unit to achieve compliance with a less stringent limit but on a more aggressive implementation schedule when compared to the enhanced compliance limit and schedule for the same equipment;
- Make the frequency of compliance testing compatible with RECLAIM sources for the same equipment size range;
- Allow for the de-rating of existing units provided that the adjusted rating is no less than two mmBTU/hr per unit;
- Allow CO compliance determinations to be conducted in accordance with the source test or portable analyzer requirements;
- Allow operators of atmospheric units to comply with a NOx limit of 12 ppm; and,
- Allow an equivalent limit for the CO limit of 400 ppm to be 0.30 lbs/mmBTU for natural gas fired units.

Summary of Chapter 3 - Existing Setting

Pursuant to the CEQA Guidelines §15125, Chapter 3 – Existing Setting, includes descriptions of those environmental areas that could be adversely affected by PAR 1146 as identified in the NOP/IS (Appendix C). The following subsection briefly highlights the existing setting for "air quality" and "hazards and hazardous materials," which were the only environmental areas identified that could potentially be adversely affected by implementing PAR 1146.

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 National Ambient Air Quality Standards (NAAQS) established for six criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide and PM10), the area within the SCAQMD's jurisdiction is only in attainment with carbon monoxide, sulfur dioxide, nitrogen dioxide and lead standards. 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. In addition, this section includes a discussion on greenhouse gases, climate change and toxic air contaminants.

Hazards and Hazardous Materials

Potential hazard impacts may be associated with the production, use, storage, and transport of hazardous materials. For the purposes of this Final ~~Draft~~ EA, the term "hazardous materials" refers to both hazardous materials and hazardous wastes. Specifically, implementation of the proposed project is expected to result in the potentially increased use of ammonia, a chronic and acutely hazardous material, in selective catalytic reduction (SCR) systems for NOx control. In general, hazards can occur due to natural events, such as earthquake, and non-natural events, such as mechanical failure or human error. The risk associated with each affected facility is defined by the probability of an event and the consequence (or hazards) should the event occur. This section discusses existing hazards to the community from potential upset conditions at the affected facilities, to provide a basis for evaluating the changes in hazards posed by PAR 1146.

The major types of public safety risks at the affected facilities consist of risk from releases of hazardous substances and from major fires and explosions. The shipping, handling, storage, and disposal of hazardous materials inherently pose a certain risk of a release to the environment. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including toxic gas clouds, torch fires, flash fires, pool fires, and vapor cloud explosions, thermal radiation and explosion/overpressure.

The use, storage and transport of hazardous materials are subject to numerous laws and regulations at all levels of government. The most relevant existing hazardous materials laws and regulations include hazardous materials management planning, hazardous materials transportation, hazardous materials worker safety requirements, hazardous waste handling requirements and emergency response to hazardous materials and waste incidents. Potential risk of upset is a factor in the production, use, storage and transportation of hazardous materials. Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions.

Releases of hazardous materials, including ammonia, have the potential for harmful effects on workers and the public. Causes of these releases may include plant upsets; leaks in seals, pipeline failures; vehicular traffic accidents; and failures during ammonia delivery, such as hose leaks.

Summary of Chapter 4 - Environmental Impacts

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

The Initial Study identified and described those environmental topics where the proposed project could cause significant adverse environmental impacts (i.e., air quality, and hazards and hazardous materials). Analysis of these environmental topics revealed that potentially significant air quality impacts may result from construction activities resulting from installing new air pollution control equipment (i.e., selective catalytic reduction or "SCR"). Also, though site-specific analyses would be speculative in nature and therefore cannot be performed herein, the NOP/IS concluded that the projected increased use of ammonia in SCR for NOx control could result in significant adverse hazard impacts.

The following subsections briefly summarize the analysis of potential adverse environmental impacts from the adoption and implementation of PAR 1146.

Air Quality

The proposed amendments to Rule 1146 are expected to result in anticipated reductions of 1.17 tons per day of NOx emissions by 2016 from approximately 1,068 boilers, steam generators, and process heaters that individually have a total rated heat input at five mmBTU/hr or higher. In order to achieve the overall net air quality benefit from implementing PAR 1146, some of the affected facilities may choose to modify existing equipment by retrofitting with air pollution control technologies in order to comply with the lowered NOx emission standards. However, in lieu of complying with the lowered NOx emission limits and to avoid making physical changes to the existing units, the equipment operator may also choose to de-rate the equipment by officially lowering the rated heat input capacity based on the manufacturer's identification or rating plate or permit condition. However, if an operator chooses to de-rate equipment, the adjusted rating is limited to no less than two mmBTU/hr per unit.

The physical changes involved that may occur as a result of implementing PAR 1146 focus on the installation of control equipment such as ultra-low NOx burners and SCRs for reducing NOx emissions. However, due to the straightforward nature and ease of installing ultra-low NOx burners relative to the installation of SCR systems, the construction activities that may adversely affect air quality are predominantly associated with the installation of SCR equipment. Because the installation of SCR equipment spans over the course of two years, the construction emissions associated with PAR 1146 were estimated at levels above the air quality significance threshold for NOx. However, because of the net NOx reductions that will be achieved from implementing PAR 1146, the net amount of NOx reductions during both construction and operations far exceeds the amount of construction NOx on a peak daily basis. Thus, the analysis concluded that construction air quality impacts from installing SCRs at the affected facilities would not be significant.

Cumulative air quality impacts from PAR 1146 and all other AQMP control measures considered together are not expected to be significant because the amount of emission reductions to be achieved by the proposed project for NOx exceed the emission reduction projections and commitments made by control measures in the 2007 AQMP and the SIP, respectively. Even though the proposed project may cause a temporary and significant adverse increase in emissions during construction, the temporary net increase in NOx emissions combined with the total net accumulated NOx emission reductions projected overall would not interfere with the air quality progress and attainment demonstration projected in the AQMP. Indeed, the 2007 AQMP indicated that, based on future anticipated overall reduction in NOx emissions, the Basin would achieve the federal ozone ambient air quality standard by the year 2024 (SCAQMD, 2007). Further, in accordance with the 2007 AQMP emission inventory trends, average annual daily CO and VOC emissions are projected to be reduced, which in spite of significant CO and VOC construction emissions for the proposed project, implementing the control measures in the 2007 AQMP will result in an overall net reduction in CO and VOC emissions. Therefore, cumulative air quality impacts from the proposed project and all other AQMP control measures, when considered together, are not expected to be significant because implementation of all AQMP control measures is expected to result in net emission reductions and overall air quality improvement.

Hazards and Hazardous Materials

Implementation of PAR 1146 may alter the hazards associated with the existing facilities affected by the proposed project. Air pollution control equipment and related devices are expected to be installed at affected facilities such that their operations may increase the quantity of hazardous materials used in the control equipment (i.e., by SCRs). Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of the proposed project.

The hazards analysis was based primarily on the installation of SCR control equipment on both medium- (rated at 20 mmBTU/hr but less than mmBTU/hr) and large-sized (rated at or greater than 75 mmBTU/hr) boilers, steam generators and process heaters. The analysis focused on one facility that operates four large-sized boilers within ¼-mile of sensitive receptors and concluded that the hazards associated with the potential rupture of the aqueous ammonia storage tank would be significant. The analysis also relied on similar projects that included retrofitting boilers, steam generators, and process heaters with SCRs. The analysis concluded that the proposed project would generate significant adverse hazards/hazardous materials impacts.

Potential Environmental Impacts Found Not To Be Significant

The Initial Study for PAR 1146 includes an environmental checklist of approximately 17 environmental topics to be evaluated for potential adverse impacts from a proposed project. Review of the proposed project at the NOP/IS stage identified two topics, "air quality" and "hazards and hazardous materials," for further review in the Final ~~Draft~~ EA. Where the Initial Study concluded that the project would have no significant direct or indirect adverse effects on the remaining environmental topics, of the comments received on the NOP/IS or at the public meetings, none of the comments changed this conclusion. The screening analysis concluded that the following environmental areas would not be significantly adversely affected by PAR 1146:

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

Consistency

The Southern California Association of Governments (SCAG) and the SCAQMD have developed, with input from representatives of local government, the industry community, public health agencies, the EPA-Region IX and the California Air Resources Board (CARB), guidance on how to assess consistency within the existing general development planning process in the Basin. Pursuant to the development and adoption of its Regional Comprehensive Plan Guide (RCPG), SCAG has developed an Intergovernmental Review Procedures Handbook (June 1,

1995). The SCAQMD also adopted criteria for assessing consistency with regional plans and the AQMP in its CEQA Air Quality Handbook. The proposed project is considered to be consistent with SCAG's RCPG because it does not interfere with achieving any of the goals identified in any of the RCPG policies.

Other CEQA Topics

CEQA documents are required to address the potential for irreversible environmental changes, growth-inducing impacts and inconsistencies with regional plans. Consistent with the Final Program EIR prepared for the 2007 AQMP, additional analysis of the proposed project confirms that it would not result in irreversible environmental changes or the irretrievable commitment of resources, foster economic or population growth or the construction of additional housing, or be inconsistent with regional plans

Summary Chapter 5 - Alternatives

Four alternatives to PAR 1146 are summarized in Table 1-2: Alternative A (No Project), Alternative B (Ultra-Low NOx Burners), Alternative C (Expedited Compliance), and Alternative D (End of Life Replacement). Pursuant to the requirements in CEQA Guidelines §15126.6 (b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potential air quality impacts from each of the project alternatives for the individual rule components that comprise PAR 1146 is provided in Table 1-3. However, the alternatives comparison in Table 1-3 does not also address the topic of hazards and hazardous materials because the potential adverse impacts initially considered in the NOP/IS were further evaluated in Chapter 4 of this Final ~~Draft~~ EA and found to be less than significant for hazards and hazardous materials. Refer to Chapter 4 of this Final ~~Draft~~ EA for the detailed analysis. Aside from the topic of air quality, no other significant adverse impacts were identified for the proposed project or any of the project alternatives. The proposed project is considered to provide the best balance between emission reductions and the adverse air quality impacts due to construction and operation activities while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 1-2
Summary of PAR 1146 & Project Alternatives

Rule Components						
Group No.	**Heat Input & Fuel Type**	**Proposed Project**	**Alternative A:** No Project	**Alternative B:** Ultra-Low NOx Burners	**Alternative C:** Expedited Compliance	**Alternative D:** End of Life Replacement
--	Any Units; non-gaseous fuel	40 ppm NOx by date of adoption	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project
--	All Units; gaseous fuel	30 ppm NOx or 0.036 lb NOx/mmBTU* by date of adoption	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project
I	≥ 75 mmBTU/hr; natural gas	5 ppm NOx or 0.0062 lb NOx/mmBTU P/C by 01/01/12 F/C by 01/01/13	30 ppm NOx or 0.036 lb NOx/mmBTU	9 ppm NOx or 0.011 lb NOx/mmBTU P/C by 01/01/14 F/C by 01/01/15	Same limits as Proposed Project but with: P/C by 01/01/11 F/C by 01/01/12	Same limits as Proposed Project but with P/C within 15 years from date of installation
II	≤ 20 x < 75 mmBTU/hr; gaseous fuel but not landfill & digester gas	Standard: 9 ppm NOx or 0.011 lb NOx/mmBTU* 75% of units: C/P by 01/01/10 P/C by 01/01/11 F/C by 01/01/12 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14 Enhanced: 5 ppm NOx or 0.0062 lb NOx/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/13 F/C by 01/01/14 100% of units: C/P by 01/01/11 P/C by 01/01/15 F/C by 01/01/16	30 ppm NOx or 0.036 lb NOx /mmBTU*	12 ppm NOx or 0.015 lb NOx/mmBTU* 100% of units: C/P by 01/01/13 P/C by 01/01/15 F/C by 01/01/16	5 ppm NOx or 0.0062 lb NOx/mmBTU* 100% of units: C/P by 01/01/10 P/C by 01/01/11 F/C by 01/01/12	5 ppm NOx; or, 0.0062 lb NOx/mmBTU* but with P/C within 15 years from date of installation

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Table 1-2 (concluded)
Summary of PAR 1146 & Project Alternatives

Rule Components						
Group No.	**Heat Input & Fuel Type**	**Proposed Project**	**Alternative A:** No Project	**Alternative B:** Ultra-Low NOx Burners	**Alternative C:** Expedited Compliance	**Alternative D:** End of Life Replacement
III	≤ 5 x < 20 mmBTU/hr includes units operated at schools & universities rated ≤ 5 mmBTU/hr; gaseous fuel but not landfill & digester gas	9 ppm NOx or 0.011 lb NOx/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13 100% of units: C/P by 01/01/11 P/C by 01/01/14 F/C by 01/01/15	30 ppm NOx or 0.036 lb NOx /mmBTU*	15 ppm NOx or 0.019 lb NOx/mmBTU* 100% of units: C/P by 01/01/15 P/C by 01/01/16 F/C by 01/01/17	Same limits as proposed project with: 100% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13	Same limits as Proposed Project with P/C within 15 years from date of installation
III	atmospheric units	12 ppm NOx or 0.015 lb NOx/mmBTU* 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14	30 ppm NOx or 0.036 lb NOx /mmBTU*	15 ppm NOx or 0.019 lb NOx/mmBTU* 100% of units: C/P by 01/01/15 P/C by 01/01/16 F/C by 01/01/17	Same limits as proposed project with: 100% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13	Same limits as Proposed Project with P/C within 15 years from date of installation
--	≤ 90,000 therms/yr; Any fuel	30 ppm NOx by 01/01/15 or burner replacement, whichever occurs later	No limit	40 ppm NOx by 01/01/17 or burner replacement, whichever occurs later	20 ppm NOx by 01/01/15	Same limit as Proposed Project with P/C within 15 years from date of installation
--	Any Units; landfill gas	25 ppm NOx with F/C by 01/01/15	30 ppm NOx	25 ppm NOx with F/C by 01/01/18	25 ppm NOx with F/C by 01/01/13	25 ppm NOx with F/C by 01/01/15
--	Any Units; digester gas	15 ppm NOx with F/C by 01/01/15	30 ppm NOx	15 ppm NOx with F/C by 01/01/18	15 ppm NOx with F/C by 01/01/13	15 ppm NOx with F/C by 01/01/15

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Table 1-3
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project	Alternative A: No Project	Alternative B: Ultra-Low NOx Burners	Alternative C: Expedited Compliance	Alternative D: End of Life Replacement
Air Quality	**Decreases total NOx emissions by 1.17 tons per day as follows:** Group I: 0.16 ton per day by 01/01/13 Group II: 0.54 ton per day (Standard: 75% of 0.51 ton/day by 01/01/12 & 100% by 01/01/14; or, Enhanced: 75% of 0.03 ton/day by 01/01/14 & 100% by 01/01/16) Group III: 0.35 ton per day with : 75% of 0.29 ton/day for sealed units by 01/01/13 and 100% by 01/01/15; and 100% of 0.05 ton/day for atmospheric units by 01/01/14 Low Usage: 0.06 ton per day Landfill Units: 0.04 ton per day by 01/01/15 Digester Gas Units: 0.02 ton per day by 01/01/15	**No change in NOx emissions.**	**Decreases total NOx emissions by 0.95 ton per day as follows:** Group I: 0.14 ton per day by 01/01/15 Group II: 0.46 ton per day by 01/01/16 Group III: 0.25 ton per day by 01/01/17 Low Usage: 0.04 ton per day by 01/01/17 or later Landfill Units: 0.04 ton per day by 01/01/18 Digester Gas Units: 0.02 ton per day by 01/01/18	**Decreases total NOx emissions by 1.29 tons per day as follows:** Group I: 0.16 ton per day by 01/01/12 Group II: 0.65 ton per day by 01/01/12 Group III: 0.35 ton per day by 01/01/13 Low Usage: 0.08 ton per day by 01/01/15 Landfill Units: 0.04 ton per day by 01/01/13 Digester Gas Units: 0.02 ton per day by 01/01/13	**Decreases total NOx emissions by 1.27 tons per day as follows:** Group I: 0.16 tons per day with P/C within 15 years from installation date Group II: 0.65 ton per day with P/C within 15 years from installation date Group III: 0.35 ton per day with P/C within 15 years from installation date Low Usage: 0.06 ton per day with P/C within 15 years from installation date Landfill Units: 0.04 ton per day by 01/01/15 Digester Gas Units: 0.02 ton per day by 01/01/15 P/C = Application for Permit to Construct
Air Quality Impacts Significant?	Not Significant for any pollutant	Not Significant for any pollutant but would likely violate HSC §§40440 and would not comply with all feasible measures specified by RACT and Control Measure MCS-01.	Not Significant for any pollutant but achieves less emission reductions by the same or later compliance dates than the proposed project.	Significant for NOx, VOC, CO, PM10, and PM2.5 during construction Significant for NOx during operation overlap in 2011 Achieves more emission reductions earlier than the proposed project but with major construction emissions penalty in 2011.	Potentially significant for NOx, VOC, CO, PM10, and PM2.5 during construction depending on number of construction overlap. Achieve slightly more emission reductions than the proposed project but less than Alternative C, and at a much later compliance timeline due to varying ages of existing equipment.

Table 1-3 (concluded)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project	Alternative A: No Project	Alternative B: Ultra-Low NOx Burners	Alternative C: Expedited Compliance	Alternative D: End of Life Replacement
Hazard Impacts	Significant for operations associated with the use and storage of aqueous ammonia	No impacts	Not Significant (less than the proposed project)	Significant for operations associated with the use and storage of aqueous ammonia (greater than the proposed project)	Significant for operations associated with the use and storage of aqueous ammonia (emissions-wise, equivalent to the proposed project, but for compliance timing, less than the proposed project)

CHAPTER 2

PROJECT DESCRIPTION

Project Location
Project Background
Project Objective
Project Description
Technology Overview

PROJECT LOCATION

The SCAQMD has jurisdiction over an area of 10,473 square miles (referred to hereafter as the district), consisting of the four-county South Coast Air Basin and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 2-1).

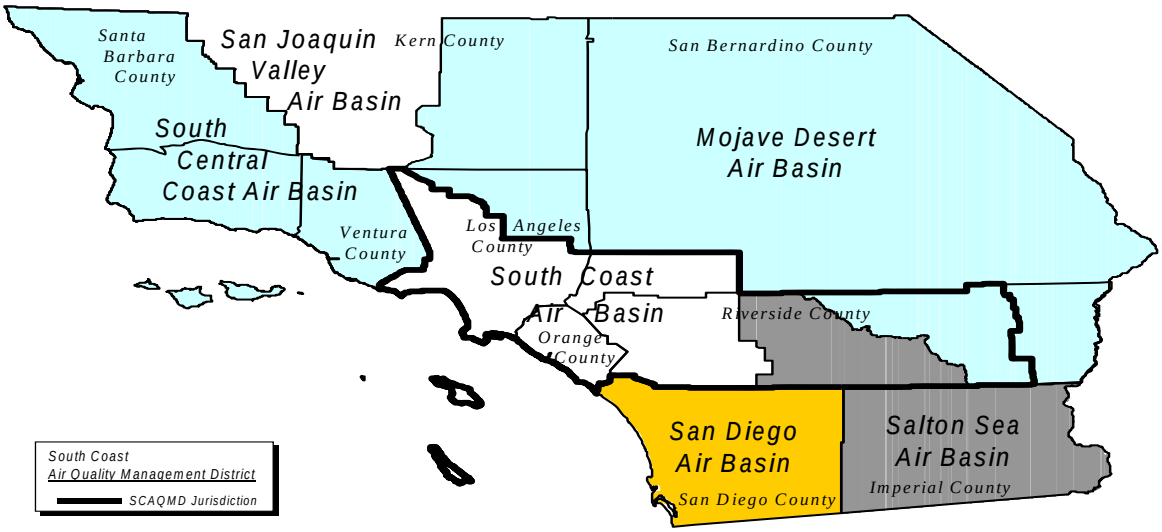

Figure 2-1
Boundaries of the South Coast Air Quality Management District

PROJECT BACKGROUND

Rule 1146 regulates both NOx and CO emissions from most boilers, steam generators and process heaters with a rated heat input capacity greater than or equal to five mmBTU/hr and are used in industrial, institutional, and commercial operations. However, Rule 1146 does not regulate NOx emissions from electric utility boilers, petroleum refinery boilers and process heaters with a rated heat input capacity greater than 40 mmBTU/hr, sulfur plant reactor boilers, waste heat recovery boilers serving combustion turbines, and an unfired waste heat recovery boiler that is used to recover heat from the exhaust of any combustion equipment. Instead, these sources are subject to other SCAQMD Rules and Regulations. Further, the NOx limits in Rule 1146 do not apply to facilities that would otherwise be subject to the NOx control requirements in the RECLAIM program.

Rule 1146 applies to several types of boilers, steam generators, and process heaters. Boilers and steam generators produce hot water or steam for use in office buildings, commercial establishments, hospitals, schools, universities, hotels and various industrial operations. Process heaters are used in industrial operations for heating material streams either directly or indirectly via heat exchangers. For each application, multiple designs of boilers, steam generators and process heaters are available in the marketplace.

Under Rule 1146, any unit with an annual fuel usage that exceeds 90,000 therms per year is currently required to either meet a 30 ppm NOx emission limit and a 400 ppm CO emission limit if the fuel burned is gaseous (i.e. natural gas), or a 40 ppm NOx emission limit and a 400 ppm CO emission limit if the fuel burned is non-gaseous (i.e. diesel). Further, any unit that burns a combination of gaseous and non-gaseous fuel in excess of 90,000 therms annually is required to meter the quantity of each fuel used and to meet a weighted average NOx emission limit between 30 and 40 ppm.

Rule 1146 also requires continuous in-stack NOx monitoring for any unit that has a maximum rated heat input of 40 mmBTU/hr or higher and has an annual heat input of 200,000 therms. All units subject to Rule 1146 are required to conduct annual emissions testing

Rule 1146 provides an exemption from complying with NOx emission limits because of low fuel usage, provided that the fuel use is metered and either the stack gas oxygen concentration is maintained at three percent or less, on a dry basis, or the unit is tuned at least twice per year. Finally, in addition to the emission limits, Rule 1146 also includes recordkeeping requirements, compliance determination procedures, a compliance schedule, exemptions, and equipment tuning procedures.

PROJECT OBJECTIVE

The primary objective of PAR 1146 is to obtain further NOx emission reductions by implementing the 2007 AQMP Control Measure CM#2007MCS-01: Facility Modernization, by requiring affected facility operators to modernize their permitted equipment via BARCT retrofits. Another objective of PAR 1146 is to comply with all feasible measures specified in the July 2006 demonstration to the EPA that SCAQMD's current air pollution rules fulfill the 8-hour ozone RACT standards. The third objective of PAR 1146 is to satisfy the all feasible measures requirements in SB 656 to reduce formation of particulate matter emissions by reducing NOx emissions from the affected categories of boilers, steam generators, and process heaters. To achieve these objectives, PAR 1146 proposes to reduce the allowable NOx emission limits for boilers, steam generators and process heaters from 30 ppm to 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. PAR 1146 will also propose NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes are proposed that include: 1) establishing a weighted average formula for dual fueled co-fired units; 2) allow existing units to be de-rated to no less than two million BTU 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 SCAQMD's RECLAIM program for the same equipment size range; and 7) allowing NOx emissions monitoring with a portable analyzer. PAR 1146 is estimated to reduce approximately 1.17 tons per day of NOx emissions by 2016.

PROJECT DESCRIPTION

The following is a summary of the key proposed amendments to Rule 1146. Other minor changes are also proposed to improve organization, clarity and consistency throughout the rule. A copy of the proposed amended rule can be found in Appendix A of this Final ~~Draft~~ EA.

Definitions

The following new definitions are added to PAR 1146: "atmospheric unit," "Group I unit," "Group II unit," "Group III unit," "health facility," "school," and "thermal fluid heater." [paragraphs (b)(3), (b)(6), (b)(7), (b)(8), (b)(9), (b)(14) and (b)(17)]

Requirements

A summary of the proposed NOx emission limits and corresponding compliance dates for each equipment rating is shown in Table 2-1. For Group II units, both standard and enhanced compliance dates are provided because equipment type and operation may make it difficult for a unit to comply with the enhanced option on a continuous basis. Consequently, the standard compliance dates option is also provided to allow the unit to achieve compliance with a less stringent limit but on a more aggressive implementation schedule when compared to the enhanced compliance limit and schedule for the same equipment. [paragraphs (c)(1), (c2), (e)(1) and (e)(2)]

PAR 1146 contains a clarification of the formula for calculating the weighted average to be based on the appropriate compliance limit and heat input for each fuel used, for dual fuel co-fired units. [paragraph (c)(3)]

Allow an equivalent limit for the CO limit of 400 ppm to be 0.30 lbs/mmBTU for natural gas fired units. [paragraph (c)(4)]

For affected unit operators who choose to select the tune-up option for verifying compliance of any unit with an annual heat input less than or equal to nine mmBTU (90,000 therms), requirements for operators to keep records for a rolling 24-month period are included as part of PAR 1146. Other clarifications to the tune-up procedures are included for consistency throughout the rule. [paragraph (c)(6)]

If, prior to the adoption of PAR 1146, unit operators installed or modified a Group III natural gas fired unit that complies with the current NOx limit of 12 ppm, compliance with the proposed lowered NOx limits may be deferred until the next time when the unit's burners are replaced. [paragraph (c)(7)]

Owner/operators of Group II or III units will be required to submit a compliance plan to show how compliance with the lowered NOx emission limits will be achieved. [paragraph (c)(9)]

Compliance Determination

Requirements for operators to conduct an emissions compliance determination at least every 250 operating hours or 30 days subsequent to the tuning or servicing of a unit unless it is an unscheduled repair are added. [paragraph (d)(2)]

Table 2-1
Proposed NOx Emission Limits & Compliance Dates

Group Unit Number	Equipment Rating	Fuel Type	Current NOx Limit	Proposed NOx Limit & Compliance Date
--	Any	non-gaseous	40 ppm	40 ppm by date of adoption
--	Any	gaseous	30 ppm or 0.036 lb/mmBTU*	30 ppm or 0.036 lb/mmBTU* by date of adoption
I	$\geq$ 75 mmBTU/hr	natural gas	30 ppm or 0.036 lb/mmBTU*	5 ppm or 0.0062 lb/mmBTU* P/C by 01/01/12 F/C by 01/01/13
II	$\leq$ 20 x < 75 mmBTU/hr	gaseous (excludes landfill & digester gases)	30 ppm or 0.036 lb/mmBTU*	Standard: 9 ppm or 0.011 lb/mmBTU* 75% of units: C/P by 01/01/10 P/C by 01/01/11 F/C by 01/01/12 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14 Enhanced: 5 ppm or 0.0062 lb/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/13 F/C by 01/01/14 100% of units: C/P by 01/01/11 P/C by 01/01/15 F/C by 01/01/16

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Table 2-1 (concluded)
Proposed NOx Emission Limits & Compliance Dates

Group Unit Number	Equipment Rating	Fuel Type	Current NOx Limit	Proposed NOx Limit & Compliance Date
III	≤ 5 x < 20 mmBTU/hr (includes units operated at schools & universities that are rated ≤ 5 mmBTU/hr)	gaseous (excludes landfill & digester gases)	30 ppm or 0.036 lb/mmBTU*	9 ppm or 0.011 lb/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13 100% of units: C/P by 01/01/11 P/C by 01/01/14 F/C by 01/01/15
III	≤ 10 mmBTU/hr	natural gas-fired atmospheric units	30 ppm or 0.036 lb/mmBTU*	12 ppm or 0.015 lb/mmBTU* 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14
--	≤ 90,000 therms/yr	Any	No limit	30 ppm NOx by 01/01/15 or burner replacement, whichever occurs later
--	Any	landfill gas	30 ppm	25 ppm NOx with F/C by 01/01/15
--	Any	digester gas	30 ppm	15 ppm NOx with F/C by 01/01/15

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Emission checks via portable analyzers or a continuous in-stack NOx monitor will be allowed for initial compliance determinations for NOx and CO emissions and will be required on a monthly basis or every 750 unit operating hours, whichever occurs later. The timing of these compliance determinations shall be conducted once every three years for units rated at 10 mmBTU/hr but less than 40 mmBTU/hr and every five years for units rated at five mmBTU/hr but less than 10 mmBTU/hr. Further, if a unit is determined to be out of compliance, the operator will be allowed 72 hours to achieve compliance or shutdown the unit. [paragraphs (d)(4), (d)(6), (d)(8), (d)(9), and (d)(10)]

In lieu of complying with the proposed NOx emission limits and compliance schedules as summarized in Table 2-1, an owner or operator may lower a Group I, II or III unit's rated heat input capacities, also referred to as "de-rating." The lowered rated heat input capacity shall be based on the manufacturer's identification or rating plate or permit condition and cannot be less than two mmBTU/hr per unit. [paragraph (d)(11)]

Compliance Schedule

PAR 1146 contains a proposal to require compliance with a 30 ppm NOx limit for low fuel usage equipment by January 1, 2015 or burner replacement, whichever occurs later. Further, operators of any low fuel usage equipment that exceeds the 90,000 therms of heat input during a 12-month period, will be required to submit an application and demonstrate compliance with the lowered NOx emission limits as summarized in Table 2-1. [paragraphs (e)(3) and (e)(4)]

In addition to the compliance schedule summarized in Table 2-1, the compliance date for health facilities complying with seismic safety requirements is proposed to be extended for the same amount of time that would be granted pursuant to Health and Safety Code §130060, but not to extend beyond January 1, 2015, or what would be granted pursuant to Health and Safety Code §130061.5, but not to extend beyond January 1, 2020, provided that a compliance plan is submitted on or before January 1, 2010. [paragraph (e)(5)]

TECHNOLOGY OVERVIEW

Combustion Equipment

To appreciate the mechanics of NOx control equipment and techniques, it is necessary to first understand how NOx emissions are generated from various combustion sources that may be potentially affected by PAR 1146 boilers, process heaters, and steam generating equipment. Combustion is a high temperature chemical reaction resulting from burning a gas, liquid, or solid fuel (e.g., natural gas, diesel, fuel oil, gasoline, propane, and coal) in the presence of air (oxygen and nitrogen) to produce: 1) heat energy; and, 2) water vapor or steam. An ideal combustion reaction is when the entire amount of fuel needed is completely combusted in the presence of air so that only carbon dioxide (CO2) and water are produced as by-products. However, since fuel contains other components such as nitrogen and sulfur plus the amount of air mixed with the fuel can vary, in practice, the combustion of fuel is not a "perfect" reaction. As such, uncombusted fuel plus smog-forming by-products such as NOx, SOx, carbon monoxide (CO), and soot (solid carbon) can be discharged into the atmosphere.

Of the total NOx emissions that can be generated, there are two types of NOx formed during combustion: 1) thermal NOx; and, 2) fuel NOx. Thermal NOx is produced from the reaction between the nitrogen and oxygen in the combustion air at high temperatures while fuel NOx is formed from a reaction between the nitrogen already present in the fuel and the available oxygen in the combustion air. As the source of nitrogen in fuel is more prevalent in oil and coal, and is negligible in natural gas, the amount of fuel NOx generated is dependent on fuel type. For example, with oil that contains significant amounts of fuel-bound nitrogen, fuel NOx can account for up to 50 percent of the total NOx emissions generated. Though boilers, process heaters, and steam generators have varying purposes in commercial, industrial, and utility applications, at a minimum, they all generate thermal NOx as a combustion by-product. The following provides a brief description of the various types of existing combustion equipment that may be affected by PAR 1146.

Boilers and Steam Generators

A typical boiler, also referred to as a steam generator, is a steel or cast-iron pressure vessel equipped with burners that combust liquid, gas, or solid fossil fuel to produce steam or hot water. The principle components of a boiler consist of a burner, firebox, heat exchanger, and a means of creating and directing gas flow through the unit. Boilers are classified according to the amount of energy output in mmBTU/hr, the type of fuel burned (natural gas, diesel, fuel oil, etc.),

operating steam pressure in pounds per square inch (psi), and heat transfer media. In addition, boilers are further defined by the type of burners used and air pollution control techniques. The burner is where the fuel and combustion air are introduced, mixed, and then combusted.

Process Heaters

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

NOx Control Techniques & Equipment

As reducing NOx emissions is the main objective of PAR 1146, there are two primary approaches for reducing NOx emissions from boilers, steam generators, and process heaters: 1) by combustion control techniques that minimize the amount of NOx formed by the combustion equipment; or 2) by installing a device that controls the NOx after it has been generated or 'post-combustion.' To minimize the amount of NOx emissions generated can be accomplished by physically modifying the combustion equipment by controlling peak combustion temperature, utilizing staged combustion, and regulating the amount of available excess air. Chemical modifications such as chemical or water/steam injection or treating the flue gas (e.g., flue gas recirculation and staged combustion) or the fuel used via selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), or SCONOx/EMx™ can be effective means for NOx control from combustion equipment.

Flue Gas Recirculation

Flue Gas Recirculation (FGR) is a very common NOx reduction method used in boilers and process heaters that recycles a portion of low oxygen combustion by-products from the stack. These recirculated gases reduce the overall combustion temperature, which in turn, helps to reduce the formation of NOx. FGR can reduce thermal NOx emissions by as much as 70 percent or greater, depending on the method of introduction of the recirculated flue gases, the amount of FGR flow, and the type of fuel combusted. For example, when firing natural gas, typical NOx reductions are 45 percent with a 10 percent recirculation rate, and 75 percent with a 20 percent recirculation rate. Flue gas recirculation is not typically used as the primary form of NOx control techniques or devices, but rather is used as part of a combination of many techniques and equipment.

Water/Steam Injection

The process of injecting water or steam into the flame in the combustion equipment reduces the flame temperature which lowers the formation of thermal NOx. Water/steam injection is typically used in conjunction with other NOx control methods such as FGR or burner modifications (e.g., ultra-low NOx burners). Estimated reductions in NOx emissions from utilizing water/steam injection varies with the type of fuel combusted. For example, the use of water/steam injection and natural gas can achieve as much as 80 percent reduction in NOx. Water/steam injection is not typically used as the primary form of NOx control techniques or devices, but rather is used as part of a combination of techniques and equipment.

Staged Combustion & Ultra-Low NOx Burners

Staged combustion is another technique that can be utilized in boilers, steam generators, and process heaters to help achieve lower NOx emissions by dividing the combustion process into a

number of stages in which the air-to-fuel ratio is varied to manipulate the conditions that would make NOx formation less ideal. Staged combustion is divided into two categories: staged air combustion and staged fuel combustion. Staged air combustion controls the formation of NOx by staging or staggering the total amount of air required for combustion to occur and can be achieved by installing ultra-low NOx burners. Only a portion of the total air needed for combustion is used to form a fuel-rich primary combustion zone, in which all of the fuel is partially burned. Then, combustion is fully completed when the remainder of the combustion air is injected into a secondary zone, which is located downstream of the fuel-rich primary zone. Because some heat is transferred prior to the completion of combustion, peak combustion temperatures are lower (which reduces formation of thermal NOx) with staged air combustion than with conventional combustion.

Without limiting the combustion air, staged fuel combustion controls the formation of NOx by staging the amount of fuel needed for combustion. With a high level of excess air in the primary combustion zone, the peak combustion temperature drops and subsequently reduces NOx formation. Additional fuel is later injected in the secondary combustion zone at a higher pressure and velocity than in the primary combustion zone, to stimulate FGR, further reduce combustion temperature, and decrease the availability of oxygen needed to form NOx.

Typically, the size of an ultra-low NOx burner will be about the same size or slightly larger than the burner being replaced. For example, the dimensions of an ultra-low NOx burner are approximately two feet by four feet for an 18 mmBTU/hr unit.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is post-combustion control equipment that is considered to be BARCT, if cost-effective, for NOx control of existing combustion sources like boilers, steam generators and process heaters as it is capable of reducing NOx emissions by as much as 90 percent or higher. A typical SCR system design can consist of an ammonia storage tank, ammonia vaporization and injection equipment, an SCR reactor with catalyst, ancillary electronic instrumentation and operations control equipment. In some situations, an SCR system may also utilize a booster fan for the flue gas exhaust and an exhaust stack. The way an SCR system reduces NOx is through a matrix of nozzles injecting a mixture of ammonia and air directly into the flue gas exhaust stream from the combustion equipment. As this mixture flows into the SCR reactor that is replete with catalyst, ammonia and oxygen (from the air), the flue gas exhaust reacts primarily (i.e., selectively) with NO and NO2 to form nitrogen and water in the presence of a catalyst. The amount of ammonia introduced into the SCR system is approximately a 1.0-to-1.05 molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. The ammonia injection rate is also regulated by the fuel flow rate to the unit.

There are two main types of catalysts used in SCRs: one in which the catalyst is coated onto a metal structure and a ceramic-based catalyst onto which the catalyst components are calcified. Commercial catalysts used in SCRs are available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide (TiO2) that is coated with either tungsten trioxide (WO3), molybdic anhydride (MoO3), vanadium pentoxide (V2O5), or iron oxide (Fe2O3). These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of approximately five years. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, et cetera. A typical catalyst

dimension would be approximately 39"x40"x12" enclosed in 5" double-wall shell containing insulation. The number of catalyst blocks needed will depend on the quantity of flue gas being treated by the SCR.

For conventional SCRs, the minimum temperature needed for NOx reduction is 500 degrees Fahrenheit (^{o}F) and the maximum operating temperature for the catalyst is 800 ^{o}F. Depending on the application, the type of fuel combusted, and the presence of sulfur compounds in the exhaust gas, the optimum flue gas temperature of an SCR system is case-by-case and will range between 550 ^{o}F and 750 ^{o}F to limit the occurrence of several undesirable side reactions at certain conditions. One of the major concerns with the SCR process is the poisoning of the catalyst due to the presence of sulfur and the oxidation of sulfur dioxide (SO2) in the exhaust gas to sulfur trioxide (SO3) and the subsequent reaction between SO3 and ammonia to form ammonium bisulfate or ammonium sulfate. The formation of either ammonium bisulfate or ammonium sulfate depends on the amount of SO3 and ammonia present in the flue gas and can cause equipment plugging downstream of the catalyst. The presence of particulates, heavy metals and silica in the flue gas exhaust can also limit catalyst performance. However, minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range will help avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as 'ammonia slip.' Depending on the type of combustion equipment utilizing SCR technology and any permit conditions, the typical amount of ammonia slip can vary between five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life, which is generally about five years. SCAQMD permits typically prohibit ammonia slip from exceeding five ppmv.

Selective Non-Catalytic Reduction

Selective non-catalytic reduction (SNCR) is another post-combustion control technique typically used to reduce the quantity of NOx produced in the hot flue gas, by injecting ammonia. The main differences between SNCR and SCR is that the SNCR reaction between ammonia and NOx in the hot flue gas occurs without the need for a catalyst, but at much higher temperatures (i.e., between 1200 ^{o}F to 2000 ^{o}F). The SNCR reaction is also affected by the short residence time of ammonia and the molecular ratio between ammonia and the initial quantities of NOx such that small quantities of unreacted ammonia remain (i.e., as ammonia slip) and is subsequently released in the flue gas. With a control efficiency ranging between 80 and 85 percent, SNCR does not achieve as great of NOx emission reductions as SCR. The need for the exhaust temperature to be high also limits the applicability of SNCR. Therefore, SNCR would not be considered equivalent to BARCT unless combined with other technologies.

SCONOx/EMx^{TM}

SCONOx/EMx^{TM} technology is a relatively new proprietary post-combustion catalytic oxidation and adsorption process that is undergoing development for controlling NOx and CO emissions for boiler, steam generator, and process heater applications. Unlike SCR, SCONOx/EMx^{TM} technology does not rely on the use of ammonia injection and is designed to operate within a lower temperature range (from 300 ^{o}F to 700 ^{o}F). However, in retrofit applications, the SCONOx/EMx^{TM} system is designed to function within a much narrower temperature range of 300 ^{o}F to 400 ^{o}F. The manufacturer claims that SCONOx/EMx^{TM} is capable of removing NOx by approximately 90 percent or to as low as two ppm, but this technology has not been successfully used on boilers, steam generators, or process heaters regulated by Rule 1146.

The catalyst used in the SCONOx/EMx^{TM} system consists of a platinum base with a potassium carbonate adsorption coating over a ceramic substrate and has a catalyst life of three years that is guaranteed by the manufacturer. The catalyst simultaneously oxidizes NO to NO2, CO to CO2, and VOCs to CO2 and water. The NO2 is adsorbed onto the catalyst surface where it is chemically converted to potassium nitrates and nitrites. The catalyst is then exposed to hydrogen gas produced from reformed natural gas with high pressure steam to regenerate the adsorption layer. Because hydrogen is used for the catalyst regeneration process, a low oxygen atmosphere is necessary to prevent dilution. As such, the catalyst bed is designed with multiple compartments that are equipped with dampers that close at the beginning of the regeneration cycle. Like SCR technology, one of the major concerns with the SCONOx/EMx^{TM} process is the potential poisoning of the catalyst due to the presence of sulfur in the flue gas. The manufacturer recommends also installing a SCOSOx^{TM} catalyst scrubber system to remove the sulfur from the exhaust upstream of the SCONOx^{TM} catalyst bed.

Though it is attractive that the SCONOx/EMx^{TM} process is less hazardous because it does not utilize ammonia injection like SCR, there are some concerns with utilizing this technology for NOx control. For example, the catalyst used in the SCONOx/EMx^{TM} process has a shorter life-span when compared to SCR (three years versus five years) and is more expensive because of its platinum base. Further, in the event of potential catalyst poisoning from sulfur in the flue gas, a SCOSOx^{TM} unit will also have to be installed, which increases the initial costs and the overall operational costs of the system. Also, since in retrofit applications the operation temperature is limited to a range from 300 ^{o}F to 400 ^{o}F, this means that the exhaust gases may need to be cooled prior to being send to the SCONOx/EMx^{TM} unit. Lastly, because the SCONOx/EMx^{TM} process requires the use of steam to regenerate the catalyst, issues can arise regarding water demand, especially since the SCAQMD area is in a drought, and water quality, resulting in the need to install wastewater processing equipment at facilities that might not already have wastewater treatment systems in place.

For these aforementioned reasons, SCONOx/EMx^{TM} technology for applications such as boilers, steam generators and process heaters is still in the experimental phase and it is not likely that any facility owner/operators will employ the use of this technology in order to comply with PAR 1146 at this time.

CHAPTER 3

EXISTING SETTING

Introduction
Current 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 NOP/IS is published. 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 §15360; see also Public Resources Code §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 notice of preparation is published, from both a local and regional perspective (CEQA Guidelines §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 air quality and hazards and hazardous materials which are the only environmental areas identified in the NOP/IS that may be adversely affected by the proposed amendments to Rule 1146. An overview of air quality in the district is given below. A more detailed discussion of current and projected future air quality in the district, with and without additional control measures can be found in the Final Program EIR for the 2007 AQMP (Chapter 3). The Final Program EIR for the 2007 AQMP contains more comprehensive information on existing and projected environmental settings for all environmental areas discussed in this chapter. Copies of the above-referenced documents are available from the SCAQMD's Public Information Center by calling (909) 396-2039.

CURRENT SETTING

The portion of PAR 1146 that could potentially result in physical modifications to affected facilities will result from either the retrofit of existing equipment with ultra-low NOx burners, or the installation of SCR systems to comply with the lower NOx emission levels. Table 3-1 summarizes the number of potentially affected equipment by category (boilers, steam generators and process heaters) that are currently emitting NOx above the proposed NOx emission levels in PAR 1146 and that could be considered potential candidates for installing ultra-low NOx burners or SCR systems. Approximately 1,068 equipment units could potentially be retrofitted with ultra-low NOx burners or SCR systems. Of the 1,068, there are approximately eight units in Group I, 173 units in Group II, and 739 units in Group III. Of the units in Group III, 614 are "sealed" units and 125 are "atmospheric" units.

Group I units would be required to achieve the most stringent of the proposed emission limits in PAR 1146 of five ppm NOx or 0.0062 lb/mmBTU NOx by January 1, 2013. To achieve the proposed emission limit of five ppm NOx, retrofitting these units with ultra-low NOx burners alone will not meet this goal. Instead, facility owners/operators would likely need to consider installing SCR systems as this technology can reduce NOx emissions below five ppm.

PAR 1146 proposes that Group II units would have a standard NOx emission limit of nine ppm, with full compliance achieved by January 1, 2012 for 75 percent of the units, and by January 1, 2014 for 100 percent of the units. PAR 1146 also has an enhanced, more stringent, NOx emissions limit proposed for Group II units at five ppm, with more time allowed to achieve full compliance, by January 1, 2014 for 75 percent of the units, and by January 1, 2016 for 100 percent of the units. With the standard compliance scenario, Group II units are also considered potential candidates for installing ultra-low NOx burners, while the installation of SCR would be necessary for Group II units complying with the enhanced NOx emission limit, depending on unit size and load.

Table 3-1
PAR 1146 Equipment Summary & Likely Compliance Methods

Group Unit Number	Equipment Rating	Fuel Type	Proposed NOx Limit & Compliance Date	Number of Equipment	NOx Emission Baseline (ton/day)	Likely Compliance Method
I	≥ 75 mmBTU/hr	natural gas	5 ppm or 0.0062 lb/mmBTU P/C by 01/01/12 F/C by 01/01/13	8	0.19	SCR
II	≤ 20 x < 75 mmBTU/hr	gaseous (excludes landfill & digester gases)	Standard: 9 ppm or 0.011 lb/mmBTU* 75% of units: C/P by 01/01/10 P/C by 01/01/11 F/C by 01/01/12 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14 Enhanced: 5 ppm or 0.0062 lb/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/13 F/C by 01/01/14 100% of units: C/P by 01/01/11 P/C by 01/01/15 F/C by 01/01/16	173	0.77 (0.73 – Standard and 0.04 Enhanced)	Standard: Ultra-Low NOx burners Enhanced: SCR
III	≤ 5 x < 20 mmBTU/hr (includes units operated at schools & universities that are rated ≤ 5 mmBTU/hr)	gaseous (excludes landfill & digester gases)	9 ppm or 0.011 lb/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13 100% of units: C/P by 01/01/11 P/C by 01/01/14 F/C by 01/01/15	614	0.42	Ultra-Low NOx burners
III	≤ 10 mmBTU/hr	Natural gas-fired atmospheric units	12 ppm or 0.015 lb/mmBTU* 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14	125	0.09	Ultra-Low NOx burners
--	≤ 90,000 therms/yr	any	30 ppm NOx by 01/01/15 or burner replacement, whichever is later	133	0.12	Ultra-Low NOx burners

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Table 3-1 (concluded)
PAR 1146 Equipment Summary & Likely Compliance Methods

Group Unit Number	Equipment Rating	Fuel Type	Proposed NOx Limit & Compliance Date	Number of Equipment	NOx Emission Baseline (tons/day)	Likely Compliance Method
--	Any	landfill gas	25 ppm NOx with F/C by 01/01/15	9	0.24	Ultra-Low NOx burners
--	Any	digester gas	15 ppm NOx with F/C by 01/01/15	9~~6~~	0.04 ~~0.03~~	Ultra-Low NOx burners

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

It is important to note that the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) conducted 260 source tests on equipment operating in its jurisdiction and 93 percent of the units tested were able to achieve compliance with an ultra-low NOx burner. Of the remaining seven percent, only five percent would be considered applicable to the Group II requirements in PAR 1146, provided that the equipment was relocated to the SCAQMD. Therefore, based on SJVUAPCD's statistics, to conservatively estimate the number of units that would not able to achieve the nine ppm NOx emission limit by utilizing ultra-low NOx burners for Group II equipment, five percent of the Group II universe or nine units would be assumed to need SCR instead.

PAR 1146 proposes that Group III sealed units would have a nine ppm NOx emission limit and atmospheric units would have a 12 ppm NOx emission limit. To achieve these limits, retrofitting the affected units with ultra-low NOx burners is expected to meet this goal, without the need for SCR technology.

If SCR retrofit technology is utilized, the use of ammonia injection would be required. This means that there would need to be an ammonia storage tank located near the affected unit, either as an existing tank on-site or space available to construct a new ammonia storage tank. Further, it should be noted that if ammonia must be delivered to the site as part of the SCR construction, current SCAQMD policy requires using 19 percent by volume aqueous ammonia. Once the SCR unit is operational, there will be ammonia slip emissions which will be subject to a permit limit of five ppm.

Facility owners/operators' decision to retrofit their existing units with an SCR system will be made on a case-by-case basis. Further, if the facility owner/operator determines that it is technologically infeasible to retrofit an existing unit or that space constraints would prevent the installation of NOx controls, then the only other way to comply with PAR 1146 would be to de-rate the existing equipment, provided that the adjusted rating is no less than two mmBTU/hr per unit.

Owners/operators of the Group III units that will need to comply with the lowered NOx emission limits in PAR 1146 are expected to retrofit the existing units with ultra-low NOx burners. Again, the decision to retrofit will need to be made on a case-by-case basis. For example, some ultra-low NOx burners require more fuel pressure via natural gas boosters or compressors than conventional burners, or fuel pretreatment to remove contaminants and moisture. Further, some burners may require more space outside of the boiler, which could potentially physically

interfere with other equipment and surrounding structures. Again if the facility owner/operator determines that it is technologically infeasible to retrofit an existing unit with an ultra-low NOx burner, then the only other way to comply with PAR 1146 would be to de-rate the unit, provided that the adjusted rating is no less than two mmBTU/hr per unit.

Table 3-2 summarizes the size distribution of the Group I units that are rated greater than 75 mmBTU/hr that would be expected to install SCR in order to meet the five ppm NOx emission standard proposed in PAR 1146.

Table 3-2
Summary of Rule 1146 Boilers, Steam Generators & Process Heaters Rated in Group I That May Consider Installing SCR

Facility	Number of Group I Boilers, Steam Generators, & Process Heaters (rated above 75 mmBTU/hr)	Actual Equipment Rating (mmBTU/hr)
A	1	224.4
B	1	100
C	4	82 each/328 total
D	1	81.4
E	1	81.3
Totals	**8**	

* The projected number of Group I Rule 1146 boilers, steam generators and process heaters estimated to be retrofitted with SCR is based on uncontrolled emissions at 30 ppm NOx and controlled emissions at five ppm NOx.

Table 3-3 summarizes the size distribution of the largest Group II units that may need SCR in the event that the 9ppm limit cannot be achieved with ultra-low NOx burner.

Table 3-3
Summary of Rule 1146 Boilers, Steam Generators & Process Heaters in Group II That May Consider Installing SCR

Facility	Number of Group II Boilers, Steam Generators, & Process Heaters (≤ 20 x < 75 mmBTU/hr)	Actual Equipment Rating (mmBTU/hr)
F	2	55 & 45/100 total
G	1	42
H	1	40
I	2	40 each/80 total
J	3	40 each/120 total
Totals	**9**	

* The projected number of Group II Rule 1146 boilers, steam generators and process heaters estimated to be retrofitted with SCR is based on uncontrolled emissions at 30 ppm NOx and controlled emissions at five ppm NOx.

AIR QUALITY

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter

less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5) sulfur dioxide (SO2) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO2, far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3-4. The SCAQMD monitors levels of various criteria pollutants at 34 monitoring stations. The 2006 air quality data from SCAQMD's monitoring stations are presented in Table 3-5.

Criteria Pollutants

Carbon Monoxide

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

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

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

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

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

Table 3-4
State and Federal Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
	CONCENTRATION, AVERAGING TIME		
Carbon Monoxide (CO)	20 ppm, 1-hour average 9.0 ppm, 8-hour average >	35 ppm, 1-hour average 9 ppm, 8-hour average >	(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.
Ozone (O3)	0.09 ppm, 1-hour average > 0.07 ppm, 8-hour average >	0.08 ppm, 8-hour average >	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) 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; (e) Vegetation damage; and, (f) Property damage.
Nitrogen Dioxide (NO2)	0.18 ppm, 1-hour average > 0.030 ppm, annual average >	0.0534 ppm, AAM >	(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.
Sulfur Dioxide (SO2)	0.25 ppm, 1-hour average > 0.04 ppm, 24-hour average >	0.50 ppm, 3-hour average 0.14 ppm, 24-hour average > 0.03 ppm, AAM >	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in person with asthma.
Suspended Particulate Matter (PM10)	20 µg/m3, AAM > 50 µg/m3, 24-hour average >	150 µg/m3, 24-hour average >	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and, (c) Increased risk of premature death from heart or lung diseases in the elderly.
Fine Particulate Matter (PM2.5)	12 µg/m3, AAM >	15 µg/m3, AAM > 35 µg/m3, 24-hour average >	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and, (c) Increased risk of premature death from heart or lung diseases in the elderly.
Lead (Pb)	1.5 µg/m3, monthly average>=	1.5 µg/m3, quarterly average >	(a) Increased body burden; and, (b) Impairment of blood formation and nerve conduction.

KEY:

ppm = parts per million parts of air, by volume	$\mu g/m^3$ = micrograms per cubic meter	km = kilometer
AAM = annual arithmetic mean	PST = Pacific Standard Time	

Table 3-4 (concluded)
State and Federal Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
	CONCENTRATION, AVERAGING TIME		
Sulfates	1 $\mu g/m^3$, 24-hour average >=		(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.
Visibility-Reducing Particles	Insufficient amount to give an extinction coefficient > 0.23 km^{-1} (visual range less than 10 miles), with relative humidity < 70 percent, 8-hour average (10 am – 6 pm, PST)		Visibility impairment on days when relative humidity is less than 70 percent.
Hydrogen Sulfide (H2S)	0.03 ppm, 1-hour average >=		Odor annoyance.
Vinyl Chloride	0.010 ppm, 24-hour average >=		Known carcinogen.

KEY:

ppm = parts per million parts of air, by volume	$\mu g/m^3$ = micrograms per cubic meter	km = kilometer
AAM = annual arithmetic mean	PST = Pacific Standard Time	

Carbon monoxide concentrations were measured at 25 locations in the Basin and neighboring SSAB areas in 2006. Carbon monoxide concentrations did not exceed the standards in 2006. The highest eight-hour average carbon monoxide concentration recorded (6.4 ppm in the South Central Los Angeles County area) was 71 percent of the federal carbon monoxide standard.

The South Coast Air Basin has historically had a persistent CO problem. However, there has been considerable improvement in CO air quality in the Basin from 1976 to 2005. In 2001, the Basin met both the federal and state 8-hour CO standards for the first time at all monitoring stations. Based on the data showing a historical decline in CO levels, in 2004, the SCAQMD formally requested the USEPA to re-designate the Basin from non-attainment to attainment with the National Ambient Air Quality Standards (NAAQS) for CO. Effective June 11, 2007, the USEPA published approved the SCAQMD's request for re-designation from non-attainment to attainment for CO. The Basin is also considered to be in attainment with the California CO standards.

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 (0.03-0.05 ppm). While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface. The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Table 3-5
2006 Air Quality Data – South Coast Air Quality Management District

CARBON MONOXIDE (CO)						
					No. Days Standard Exceeded[a]	
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. (ppm, 1-hour)	Max. Conc. (ppm, 8-hour)	Federal > 9 ppm, 8-hour	State > 9.0 ppm, 8-hour
LOS ANGELES COUNTY (Co)						
1	Central Los Angeles	362	3	2.6	0	0
2	Northwest Coast Los Angeles Co	365	3	2.0	0	0
3	Southwest Coast Los Angeles Co	363	3	2.3	0	0
4	South Coastal Los Angeles Co1	360	4	3.4	0	0
4	South Coastal Los Angeles Co2	--	--	--	--	--
6	West San Fernando Valley	365	5	3.4	0	0
7	East San Fernando Valley	365	4	3.5	0	0
8	West San Gabriel Valley	360	4	2.8	0	0
9	East San Gabriel Valley 1	365	2	1.7	0	0
9	East San Gabriel Valley 2	363	2	2.0	0	0
10	Pomona/Walnut Valley	365	3	2.1	0	0
11	South San Gabriel Valley	232*	3*	2.7*	0*	0*
12	South Central LA County	365	8	6.4	0	0
13	Santa Clarita Valley	363	2	1.3	0	0
ORANGE COUNTY						
16	North Orange County	362	6	3.0	0	0
17	Central Orange County	365	5	3.0	0	0
18	North Coastal Orange County	365	4	3.0	0	0
19	Saddleback Valley	365	2	1.8	0	0
RIVERSIDE COUNTY						
22	Norco/Corona	--	--	--	--	--
23	Metropolitan Riverside County 1	365	3	2.1	0	0
23	Metropolitan Riverside County 2	365	4	2.3	0	0
23	Mira Loma	364	4	2.7	0	0
24	Perris Valley	--	--	--	--	--
25	Lake Elsinore	362	1	1.0	0	0
29	Banning Airport	--	--	--	--	--
30	Coachella Valley 1**	365	2	1.0	0	0
30	Coachella Valley 2**	--	--	--	--	--
SAN BERNARDINO COUNTY						
32	NW San Bernardino Valley	360	3	1.8	0	0
33	SW San Bernardino Valley	--	--	--	--	--
34	Central San Bernardino Valley 1	365	3	2.0	0	0
34	Central San Bernardino Valley 2	364	3	2.3	0	0
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--	--
	DISTRICT MAXIMUM		8	6.4	0	0
	SOUTH COAST AIR BASIN		8	6.4	0	0

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
-- = Pollutant not monitored	** Salton Sea Air Basin

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

Table 3-5 (Continued)
2006 Air Quality Data – South Coast Air Quality Management District

OZONE (O_3)										
							No. Days Standard Exceeded			
							Federal [b]		State [b]	
Source Rec. Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. (ppm, 1-hr)	Max. Conc. (ppm, 8-hr)	Fourth Highest Conc. (ppm, 8-hr)	Health Advisory ≥ 0.15 ppm, 1-hr	> 0.12 ppm, 1-hr	> 0.08 ppm, 8-hr	> 0.09 ppm, 1-hr	> 0.07 ppm, 1-hr
LOS ANGELES (LA) COUNTY (Co)										
1	Central LA	362	0.11	0.079	0.077	0	0	0	8	4
2	NW Coastal LA Co	365	0.10	0.074	0.069	0	0	0	3	0
3	SW Coastal LA Co	360	0.08	0.066	0.062	0	0	0	0	0
4	South Coastal LA Co1	364	0.08	0.058	0.058	0	0	0	0	0
4	South Coastal LA Co2	--	--	--	--	--	--	--	--	--
6	West San Fernando V	361	0.16	0.108	0.105	1	6	17	32	39
7	East San Fernando V	365	0.17	0.128	0.099	2	6	12	25	23
8	W San Gabriel Valley	365	0.15	0.117	0.095	1	5	7	25	24
9	E San Gabriel Valley 1	364	0.17	0.120	0.091	2	7	10	23	19
9	E San Gabriel Valley 2	363	0.18	0.128	0.107	2	10	15	37	31
10	Pomona/Walnut Valley	365	0.15	0.128	0.109	2	9	16	32	30
11	S San Gabriel Valley	250*	0.13*	0.095*	0.080*	0*	1*	3*	9*	5*
12	South Central LA Co	365	0.09	0.066	0.064	0	0	0	0	0
13	Santa Clarita Valley	359	0.16	0.120	0.112	1	20	40	62	64
ORANGE (OR) COUNTY (Co)										
16	North Orange Co	362	0.15	0.114	0.092	1	3	4	8	9
17	Central Orange Co	365	0.11	0.088	0.072	0	0	1	5	3
18	North Coastal OR Co	365	0.07	0.064	0.062	0	0	0	0	0
19	Saddleback Valley	356	0.12	0.105	0.092	0	0	6	13	17
RIVERSIDE (RV) COUNTY (Co)										
22	Norco/Corona	--	--	--	--	--	--	--	--	--
23	Metropolitan RV Co 1	365	0.15	0.116	0.113	1	8	30	45	59
23	Metropolitan RV Co 2	--	--	--	--	--	--	--	--	--
23	Mira Loma	364	0.16	0.119	0.107	1	4	25	39	48
24	Perris Valley	351	0.17	0.122	0.114	3	12	53	76	84
25	Lake Elsinore	362	0.14	0.109	0.102	0	3	24	40	58
29	Banning Airport	357	0.14	0.115	0.104	0	8	44	57	78
30	Coachella Valley 1**	361	0.13	0.109	0.101	0	2	23	37	67
30	Coachella Valley 2**	364	0.10	0.089	0.087	0	0	7	4	29
SAN BERNARDINO (SB) COUNTY										
32	Northwest SB Valley	365	0.17	0.130	0.114	2	14	25	50	54
33	Southwest SB Valley	--	--	--	--	--	--	--	--	--
34	Central SB Valley 1	361	0.16	0.123	0.116	1	12	29	47	49
34	Central SB Valley 2	362	0.15	0.127	0.119	3	10	29	52	57
35	East SB Valley	365	0.16	0.135	0.125	5	11	36	60	64
37	Central SB Mountains	365	0.16	0.142	0.112	2	9	59	71	96
38	East SB Mountains	--	--	--	--	--	--	--	--	--
DISTRICT MAXIMUM			0.18	0.142	0.125	5	20	59	76	96
SOUTH COAST AIR BASIN			0.18	0.142	0.125	10	35	86	102	121

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
-- - Pollutant not monitored	** Salton Sea Air Basin

b) The federal 1-hour ozone standard was revoked and replaced by the 8-hour average ozone standard effective June 15, 2005. The 8-hour average California ozone standard of 0.07 ppm was established effective May 17, 2006.

Table 3-5 (Continued)
2006 Air Quality Data – South Coast Air Quality Management District

NITROGEN DIOXIDE (NO_2)				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. (ppm, 1-hour[c])	Annual Average[c] AAM Conc. (ppm)
LOS ANGELES COUNTY (Co)				
1	Central Los Angeles	360	0.11	0.0288
2	Northwest Coastal Los Angeles Co	365	0.08	0.0173
3	Southwest Coastal Los Angeles Co	351	0.10	0.0155
4	South Coastal Los Angeles Co1	357	0.10	0.0215
4	South Coastal Los Angeles Co2	--	--	--
6	West San Fernando Valley	363	0.07	0.0174
7	East San Fernando Valley	365	0.10	0.0274
8	West San Gabriel Valley	365	0.12	0.0245
9	East San Gabriel Valley 1	365	0.11	0.0258
9	East San Gabriel Valley 2	362	0.10	0.0206
10	Pomona/Walnut Valley	365	0.10	0.0307
11	South San Gabriel Valley	204*	0.10*	0.0283*
12	South Central LA County	363	0.14	0.0306
13	Santa Clarita Valley	359	0.08	0.0184
ORANGE COUNTY				
16	North Orange County	361	0.09	0.0224
17	Central Orange County	343	0.11	0.0197
18	North Coastal Orange County	361	0.10	0.0145
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	--	--	--
23	Metropolitan Riverside County 1	365	0.08	0.0199
23	Metropolitan Riverside County 2	--	--	--
23	Mira Loma	332	0.08	0.0194
24	Perris Valley	--	--	--
25	Lake Elsinore	352	0.07	0.0151
29	Banning Airport	355	0.11	0.0161
30	Coachella Valley 1**	359	0.09	0.0103
30	Coachella Valley 2**	--	--	--
SAN BERNARDINO (SB) COUNTY				
32	Northwest SB Valley	337	0.10	0.0310
33	Southwest SB Valley	--	--	--
34	Central SB Valley 1	362	0.09	0.0270
34	Central SB Valley 2	362	0.09	0.0252
35	East SB Valley	--	--	--
37	Central SB Mountains	--	--	--
38	East SB Mountains	--	--	--
DISTRICT MAXIMUM			0.14	0.0310
SOUTH COAST AIR BASIN			0.14	0.0310

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
AAM = Annual Arithmetic Mean	** Salton Sea Air Basin
-- = Pollutant not monitored	

c) The state standard is 1-hour average NO_2 > 0.25 ppm. The federal standard is annual arithmetic mean NO_2 > 0.0534 ppm. Air Resources Board has approved to lower the NO_2 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. The revisions are expected to become effective later in 2007.

Table 3-5 (Continued)
2006 Air Quality Data – South Coast Air Quality Management District

SULFUR DIOXIDE (SO_2)				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Concentration[d]	
			(ppm, 1-hour)	(ppm, 24-hour)
LOS ANGELES COUNTY				
1	Central Los Angeles	365	0.03	0.006
2	Northwest Coast Los Angeles County	--	--	--
3	Southwest Coast Los Angeles County	363	0.02	0.006
4	South Coastal Los Angeles County 1	364	0.03	0.010
4	South Coastal Los Angeles County 2	--	--	--
6	West San Fernando Valley	--	--	--
7	East San Fernando Valley	360	0.01	0.004
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	--	--	--
18	North Coastal Orange County	353	0.01	0.004
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	--	--	--
23	Metropolitan Riverside County 1	365	0.01	0.004
23	Metropolitan Riverside County 2	--	--	--
23	Mira Loma	--	--	--
24	Perris Valley	--	--	--
25	Lake Elsinore	--	--	--
29	Banning Airport	--	--	--
30	Coachella Valley 1**	--	--	--
30	Coachella Valley 2**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	--	--	--
33	Southwest San Bernardino Valley	--	--	--
34	Central San Bernardino Valley 1	365	0.01	0.003
34	Central San Bernardino Valley 2	--	--	--
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
	DISTRICT MAXIMUM		0.03	0.010
	SOUTH COAST AIR BASIN		0.03	0.010

KEY:

ppm = parts per million parts of air, by volume	-- = Pollutant not monitored
** Salton Sea Air Basin	

d) The state standards are 1-hour average SO_2 > 0.25 ppm and 24-hour average SO_2 > 0.04 ppm. The federal standards are annual arithmetic mean SO_2 > 0.03 ppm, 24-hour average > 0.14 ppm, and 3-hour average > 0.50 ppm. The federal and state SO_2 standards were not exceeded.

Table 3-5 (Continued)
2006 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM10 [e]						
				No. (%) Samples Exceeding Standard		
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. (µg/m^3, 24-hour)	Federal > 150 µg/m^3, 24-hour	State > 50 µg/m^3, 24-hour	Annual Average[f] AAM Conc. (µg/m^3)
LOS ANGELES COUNTY (Co)						
1	Central Los Angeles	59	59	0	3(5.1)	30.3
2	NW Coastal Los Angeles County	--	--	--	--	--
3	SW Coast Los Angeles County2	51	45	0	0	26.5
4	South Coastal Los Angeles County1	61	78	0	6(9.8)	31.1
4	South Coastal Los Angeles County2	58	117	0	19(32.7)	45.0
6	West San Fernando Valley	--	--	--	--	--
7	East San Fernando Valley	54	71	0	10(18.5)	35.6
8	West San Fernando Valley	--	--	--	--	--
9	East San Gabriel Valley 1	58	81	0	7(12.1)	31.9
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	--	--	--	--	--
12	South Central LA County	--	--	--	--	--
13	Santa Clarita Valley	58	53	0	1(1.7)	23.4
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	56	104	0	7(12.5)	33.4
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	50	57	0	1(2.0)	22.8
RIVERSIDE COUNTY						
22	Norco/Corona	57	74	0	10(17.5)	36.5
23	Metropolitan Riverside County 1	118	109	0	71(60.2)	54.4
23	Metropolitan Riverside County 2	--	--	--	--	--
23	Mira Loma	59	124	0	41(69.5)	64.0
24	Perris Valley	54	125	0	19(35.2)	45.0
25	Lake Elsinore	--	--	--	--	--
29	Banning Airport	55	75	0	8(14.6)	31.1
30	Coachella Valley 1**	57	73+	0+	2(3.5)+	24.5+
30	Coachella Valley 2**	115	122+	0+	57(49.6)+	52.7+
SAN BERNARDINO COUNTY-						
32	NW San Bernardino Valley	--	--	--	--	--
33	SW San Bernardino Valley	62	78	0	17(27.4)	42.3
34	Central San Bernardino Valley 1	60	142	0	31(51.7)	53.5
34	Central San Bernardino Valley 2	57	92	0	24(42.1)	46.0
35	East San Bernardino Valley	60	103	0	12(20.0)	36.2
37	Central San Bernardino Mountains	58	63	0	1(1.7)	26.2
38	East San Bernardino Mountains	--	--	--	--	--
	DISTRICT MAXIMUM		142+	0+	71	64.0
	SOUTH COAST AIR BASIN		142+	0+	75	64.0

KEY:

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

e) PM10 samples were collected every 6 days at all sites except for Station Number 4144 and 4157 where samples were collected every 3 days.

f) Federal annual PM10 standard (AAM > 50 µg/m^3) was revoked effective December 17, 2006. State standard is annual average (AAM) > 20 µg/m3.

Table 3-5 (Continued)
2006 Air Quality Data – South Coast Air Quality Management District

FINE PARTICULATE MATTER PM2.5 [g]						
					No. (%) Samples Exceeding Standard	Annual Average [h]
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. (µg/m^3, 24-hour)	98th Percentile Conc. (µg/m^3, 24-hour)	Federal > 65 µg/m^3, 24-hour	AAM Conc. (µg/m^3)
LOS ANGELES COUNTY (Co)						
1	Central Los Angeles	330	56.2	38.9	0	15.6
2	Northwest Coastal Los Angeles Co	--	--	--	--	--
3	Southwest Coastal Los Angeles Co 2	--	--	--	--	--
4	South Coastal Los Angeles Co 1	290*	58.5*	34.9*	0*	14.2*
4	South Coastal Los Angeles County 2	320	53.6	35.3	0	14.5
6	West San Fernando Valley	92	44.1	32.0	0	12.9
7	East San Fernando Valley	104	50.7	43.4	0	16.6
8	West San Gabriel Valley	113	45.9	32.1	0	13.4
9	East San Gabriel Valley 1	278*	52.8*	38.5*	0*	15.5*
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	116	72.2	43.1	1(0.9)	16.7
12	South Central LA County	107	55.0	44.5	0	16.7
13	Santa Clarita Valley	--	--	--	--	--
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	330	56.2	40.5	0	14.1
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	106	47.0	25.7	0	11.0
RIVERSIDE COUNTY						
22	Norco/Corona	--	--	--	--	--
23	Metropolitan Riverside County 1	300	68.5	53.7	1(0.3)	19.0
23	Metropolitan Riverside County 2	105	55.3	47.7	0	17.0
23	Mira Loma	113	63.0	52.5	0	20.6
24	Perris Valley	--	--	--	--	--
25	Lake Elsinore	--	--	--	--	--
29	Banning Airport	--	--	--	--	--
30	Coachella Valley 1**	111	24.8	15.9	0	7.7
30	Coachella Valley 2**	107	24.3	19.1	0	9.5
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	--	--	--	--	--
33	Southwest San Bernardino Valley	107	53.7	41.5	0	18.5
34	Central San Bernardino Valley1	112	52.6	43.8	0	17.6
34	Central San Bernardino Valley2	102	55.0	48.4	0	17.8
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	42*	40.1*	40.1*	0*	11.2*
DISTRICT MAXIMUM			72.2	53.7	1	20.6
SOUTH COAST AIR BASIN			72.2	53.7	1	20.6

KEY:

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

g) PM2.5 samples were collected every 3 days at all sites except for the following sites: Station Numbers 060, 072, 077, 087, 3176, and 4144 where samples were taken every day, and Station Number 5818 where samples were taken every 6 days.

h) Federal PM2.5 standard is annual average (AAM) > 15 µg/m^3. State standard is annual average (AAM) > 12 µg/m^3.

i) USEPA has revised the federal 24-hour PM2.5 standard from 65 µg/m^3 to 35 µg/m^3, effective December 17, 2006.

Table 3-5 (Continued)
2006 Air Quality Data – South Coast Air Quality Management District

TOTAL SUSPENDED PARTICULATES (TSP) [j]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. ($\mu g/m^3$, 24-hour)	Annual Average AAM Conc. ($\mu g/m^3$)
LOS ANGELES COUNTY (Co)				
1	Central Los Angeles	59	109	63.3
2	Northwest Coastal Los Angeles Co	56	76	40.2
3	Southwest Coast Los Angeles Co 2	56	84	43.1
4	South Coastal Los Angeles Co 1	62	157	62.9
4	South Coast Los Angeles Co 2	59	192	71.1
6	West San Fernando Valley	--	--	--
7	East San Fernando Valley	--	--	--
8	West San Gabriel Valley	60	123	42.8
9	East San Gabriel Valley 1	59	142	68.4
9	East San Gabriel Valley 2	--	--	--
10	Pomona/Walnut Valley	--	--	--
11	South San Gabriel Valley	58	768	79.3
12	South Central LA County	58	147	68.4
13	Santa Clarita Valley	--	--	--
ORANGE COUNTY				
16	North Orange County	--	--	--
17	Central Orange County	--	--	--
18	North Coastal Orange County	--	--	--
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	--	--	--
23	Metropolitan Riverside County 1	59	169	91.2
23	Metropolitan Riverside County 2	59	131	72.9
23	Mira Loma	--	--	--
24	Perris Valley	--	--	--
25	Lake Elsinore	--	--	--
29	Banning Airport	--	--	--
30	Coachella Valley 1**	--	--	--
30	Coachella Valley 2**	--	--	--
SAN BERNARDINO COUNTY				
32	NW San Bernardino Valley	58	105	54.6
33	SW San Bernardino Valley	--	--	--
34	Central San Bernardino Valley 1	59	190	101.0
34	Central San Bernardino Valley 2	54	174	87.0
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			768	101.0
SOUTH COAST AIR BASIN			768	101.0

KEY:

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

j) Total suspended particulates were determined from samples collected every 6 days by the high volume sampler method, on glass fiber filter media.

Table 3-5 (Concluded)
2006 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	LEAD[k] Max. Monthly Average Conc.[l] ($\mu g/m^3$)	LEAD[k] Max. Quarterly Average Conc.[l] ($\mu g/m^3$)	SULFATE (SOx)[k] Max. Conc. ($\mu g/m^3$, 24-hour)	SULFATE (SOx)[k] No. (%) Samples Exceeding State Standard ($\geq$ 25 $\mu g/m^3$, 24-hour)
LOS ANGELES COUNTY (Co)					
1	Central Los Angeles	0.02	0.01	18.2	0
2	Northwest Coastal Los Angeles Co	--	--	12.2	0
3	Southwest Coastal Los Angeles Co 2	0.01	0.01	13.6	0
4	South Coastal Los Angeles Co 1	0.01	0.01	17.8	0
4	South Coastal Los Angeles Co 2	0.01	0.01	18.8	0
6	West San Fernando Valley	--	--	--	--
7	East San Fernando Valley	--	--	--	--
8	West San Gabriel Valley	--	--	28.7	1(1.7)
9	East San Gabriel Valley 1	--	--	20.8	0
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.03	0.02	28.6	1(1.7)
12	South Central LA County	0.02	0.02	24.1	0
13	Santa Clarita Valley	--	--	--	--
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metropolitan Riverside County 1	0.01	0.01	10.8	0
23	Metropolitan Riverside County 2	0.01	0.01	9.9	0
23	Mira Loma	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
29	Banning Airport	--	--	--	--
30	Coachella Valley 1**	--	--	--	--
30	Coachella Valley 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW San Bernardino Valley	0.01	0.01	9.1	0
33	SW San Bernardino Valley	--	--	--	--
34	Central San Bernardino Valley 1	--	--	10.3	0
34	Central San Bernardino Valley 2	0.02	0.01	11.0	0
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		0.03	0.02	28.7	1
SOUTH COAST AIR BASIN		0.03	0.02	28.7	1

KEY:

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

k) Lead and sulfate were determined from samples collected every 6 days by the high volume sampler method, on glass fiber filter media.
l) Federal lead standard is quarterly average > 1.5 $\mu g/m^3$; and state standard is monthly average > $\mu g/m^3$. No location exceeded lead standards.

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

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

In 2006, the SCAQMD regularly monitored ozone concentrations at 29 locations in the Basin and SSAB. All areas monitored were below the stage 1 episode level (0.20 ppm), but the maximum concentrations in the Basin exceeded the health advisory level (0.15 ppm). Maximum ozone concentrations in the SSAB areas monitored by the SCAQMD were lower than in the Basin and were below the health advisory level.

In 2006, the maximum ozone concentration in the Basin continued to exceed federal standards by wide margins. Maximum one-hour and eight-hour average ozone concentrations were 0.18 ppm and 0.142 ppm (the one-hour was recorded in East San Gabriel Valley and the eight-hour was recorded in Central San Bernardino Mountains area). The eight-hour standard was 178 percent of the federal standards. The federal one-hour standard was revoked and replaced by the eight hour standard on June 15, 2005.

In 1997, the USEPA promulgated a new eight-hour NAAQS for ozone. Soon thereafter, a court decision ordered that the USEPA could not enforce the new standard until adequate justification for the new standard was provided. The USEPA appealed the decision to the Supreme Court. On February 27, 2001, the Supreme Court upheld USEPA's authority and methods to establish clean air standards. The Supreme Court, however, ordered USEPA to revise its implementation plan for the new ozone standard. The EPA has since adopted the new eight-hour standard. Meanwhile, the California Air Resources Board (CARB) and local air districts continue to collect technical information in order to prepare for an eventual State Implementation Plan (SIP) to reduce unhealthful levels of ozone in areas violating the new federal standard. California has previously developed a SIP for the one-hour ozone standard, which has been approved by USEPA for the South Coast Air Basin.

The objective of the 2007 AQMP is to attain and maintain ambient air quality standards. Based upon the modeling analysis described in the Final Program EIR for the 2007 AQMP implementation of all control measures contained in the 2007 AQMP is anticipated to bring the district into compliance with the federal eight-hour ozone standard by 2024 and the state eight-hour ozone standard beyond 2024.

Nitrogen Dioxide

Nitrogen dioxide (NO2) is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from nitrogen (N2) and oxygen (O2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO2. NO2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO2, are referred to collectively as NOx. In the presence of sunlight, NO2 reacts to form NO plus an extra oxygen atom. The extra oxygen atom can react further to form ozone (O3), via a complex series of chemical reactions involving hydrocarbons. NO2 may also react to form nitric acid (HNO3) which reacts further to form nitrates, components of PM2.5 and PM10.

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

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

In 2006, nitrogen dioxide concentrations were monitored at 24 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 state standard for NO2 was not exceeded at any SCAQMD monitoring location in 2006. The highest one-hour average concentration recorded (0.14 ppm in South Central Los Angeles) was 56 percent of the state standard. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations.

Sulfur Dioxide

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

Exposure for 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, an increase in the resistance to air flow, as well as a reduction in breathing capacity leading to severe breathing difficulties, is observed after exposure to high levels of 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 SO2 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.

Though SO2 concentrations remain well below the standards, SO2 is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. No exceedances of federal or state standards for SO2 occurred in 2006 at any of the seven SCAQMD locations monitored. However, the standards for PM10 and PM2.5 were both exceeded in 2006. SO2 was not measured at SSAB sites in 2006. Because historical measurements showed SO2 concentrations to be well below standards, 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 with an aerodynamic diameter less than about 10 micrometers or 2.5 micrometers or PM10 and PM2.5, respectively) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

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

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

The SCAQMD monitored PM10 concentrations at 21 locations in 2006. Maximum 24-hour average and annual average PM10 concentrations were 142 $\mu g/m^3$ recorded in the South Coastal San Bernardino Valley area and 64.0 $\mu g/m^3$ recorded in the Mira Loma area. In 2006, the federal 24-hour standard was not exceeded at any of the monitoring locations. However, the more stringent state standards were exceeded at all but one of the monitoring stations (Southwest Coastal Los Angeles county – station number 820).

The SCAQMD began regular monitoring of PM2.5 in 1999 following the USEPA's adoption of the national PM2.5 standards in 1997. In 2006, PM2.5 concentrations were monitored at 20 locations throughout the district. The PM2.5 24-hour federal standard was lowered from 65 micrograms per cubic meter to 35 micrograms per cubic meter, effective December 17, 2006. The revised federal 24-hour PM2.5 standard was exceeded at 18 monitoring locations in 2006.

Maximum 24-hour average and annual average PM2.5 concentrations (72.2 μg/m^3 recorded in the South Central Los Angeles County area and 20.6 μg/m^3 recorded in the Mira Loma area) were 206 and 137 percent of the federal 24-hour (65 μg/m^3) and annual average standards, respectively.

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

Lead

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have historically been the main sources of lead emitted into the air. However, due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric lead in the Basin over the past two 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 bone tissue due to 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 bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

The federal and state standards for lead were not exceeded in any area of the SCAQMD in 2006. There have been no violations of the standards at the SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. The maximum quarterly average lead concentration (0.02 μg/m^3) was one percent of both the federal and state standards. Additionally, special monitoring stations immediately adjacent to stationary sources of lead (e.g., lead smelting facilities) have not recorded exceedances of the standards in localized areas of the Basin since 1991 and 1994 for the federal and state standards, respectively. The maximum monthly and quarterly average lead concentration (0.44 μg/m3 and 0.34 μg/m3 in Central Los Angeles), measured at special monitoring sites immediately adjacent to stationary sources of lead were 29 and 23 percent of the state and federal standards, respectively. No lead data were obtained at SSAB and Orange County stations in 2006, and because historical lead data showed concentrations in SSAB and Orange County areas to be well below the standard, measurements have been discontinued.

Sulfates

Sulfates (SOx) are chemical compounds which contain the sulfate ion and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are produced by

oxidation of SO2. Oxidation of sulfur dioxide yields sulfur trioxide (SO3) which reacts with water to form sulfuric acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

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

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

In 2006, the state sulfate standard was exceeded at two monitoring locations (West San Gabriel Valley – station number 088 and South San Gabriel Valley – station number 085). No sulfate data were obtained at Orange County stations in 2006. Because historical SOx data showed concentrations in the Orange County area to be well below the standard, measurements have been discontinued in this area.

Visibility Reducing Particles

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

The visibility standard is based on the distance that atmospheric conditions allow a person to see at a given time and location. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter. Visibility degradation occurs when visibility reducing particles are produced in sufficient amounts such that the extinction coefficient is greater than 0.23 inverse kilometers (to reduce the visual range to less than 10 miles) at relative humidity less than 70 percent, 8-hour average (10am - 6pm). Future-year visibility in the Basin is projected empirically using the results derived from a regression analysis of visibility with air quality measurements. The regression data set consisted of aerosol composition data collected during a special monitoring program conducted concurrently with visibility data collection (prevailing visibility observations from airports and visibility measurements from District monitoring stations). A full description of the visibility analysis is given in Technical Report V-C of the 1994 AQMP.

With future year reductions of PM2.5 from implementation of all proposed emission controls for 2015, the annual average visibility would improve from 12 miles (calculated for 2005) to over 20 miles at Rubidoux, for example. Visual range in 2021 at all other Basin sites is expected to equal or exceed the Rubidoux visual range. Visual range is expected to double from the 2005 baseline due to reductions of secondary PM2.5, directly emitted PM2.5 (including diesel soot) and lower nitrogen dioxide concentrations as a result of 2007 AQMP controls.

Volatile Organic Compounds

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

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

Greenhouse Gases

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

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

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

CO2 is an odorless, colorless natural greenhouse gas. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO2 are from burning coal, oil, natural gas, and wood. CH4 is a flammable gas and is the main component of natural gas. N2O, also known as laughing gas, is a colorless greenhouse gas. Some industrial processes such as fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions also contribute to the atmospheric load of N2O. HFCs are

synthetic man-made chemicals that are used as a substitute for chlorofluorocarbons (whose production was stopped as required by the Montreal Protocol) for automobile air conditioners and refrigerants. The two main sources of PFCs are primary aluminum production and semiconductor manufacture. SF6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Scientific consensus, as reflected in recent reports issued by the United Nations Intergovernmental Panel on Climate Change, is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Industrial activities, particularly increased consumption of fossil fuels (e.g., gasoline, diesel, wood, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHGs emissions (CEC, 2004). The most recent GHG inventory for California is presented in Table 3-6 (CARB, 2007). Approximately 80 percent of GHGs in California are from fossil fuel combustion and over 70 percent of GHG emissions are CO2 emissions (see Table 3-6).

In June 2005, Governor Schwarzenegger signed Executive Order #S-3-05 which established the following greenhouse gas reduction targets:

- By 2010, reduce GHGs to 2000 emission levels,
- By 2020, reduce GHGs to 1990 emission levels, and
- By 2050, reduce GHGs to 80 percent below 1990 emission levels.

On September 27, 2006, Assembly Bill (AB) 32, the California Global Warming Solutions Act, of 2006 was enacted by the State of California and signed by Governor Schwarzenegger. AB32 expanded on Executive Order #S-3-05. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB32 represents the first enforceable state-wide program in the United States to cap all GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB32 lays out a program to inventory and reduce greenhouse gas emissions in California and from power generation facilities located outside the state that serve California residents and businesses.

AB32 will require CARB to:

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

The combination of Executive Order #S-3-05 and AB32 will require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Table 3-6
California GHG Emissions and Sinks Summary
(Million metric tons of CO_2 equivalence)

Categories Included in the Inventory	1990	2004
ENERGY	**386.41**	**420.91**
Fuel Combustion Activities	**381.16**	**416.29**
Energy Industries	157.33	166.43
Manufacturing Industries & Construction	24.24	19.45
Transport	150.02	181.95
Other Sectors	48.19	46.29
Non-Specified	1.38	2.16
Fugitive Emissions from Fuels	**5.25**	**4.62**
Oil and Natural Gas	2.94	2.54
Other Emissions from Energy Production	2.31	2.07
INDUSTRIAL PROCESSES & PRODUCT USE	**18.34**	**30.78**
Mineral Industry	4.85	5.90
Chemical Industry	2.34	1.32
Non-Energy Products from Fuels & Solvent Use	2.29	1.37
Electronics Industry	0.59	0.88
Product Uses as Substitutes for Ozone Depleting Substances	0.04	13.97
Other Product Manufacture & Use Other	3.18	1.60
Other	5.05	5.74
AGRICULTURE, FORESTRY, & OTHER LAND USE	**19.11**	**23.28**
Livestock	11.67	13.92
Land	0.19	0.19
Aggregate Sources & Non-CO_2 Emissions Sources on Land	7.26	9.17
WASTE	**9.42**	**9.44**
Solid Waste Disposal	6.26	5.62
Wastewater Treatment & Discharge	3.17	3.82
EMISSION SUMMARY		
Gross California Emissions	**433.29**	**484.4**
Sinks and Sequestrations	**-6.69**	**-4.66**
Net California Emissions	**426.60**	**479.74**

Source: CARB, 2007

Climate Change

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

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below two degrees Celsius, which is assumed to be necessary to avoid dangerous climate change.

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

The impacts of climate change will also affect projects in various ways. Effects of climate change are specifically mentioned in AB32 such as rising sea levels and changes in snow pack. The extent of climate change impacts at specific locations remains unclear. However, it is expected that California agencies will more precisely quantify impacts in various regions of the State. As an example, it is expected that the Department of Water Resources will formalize a list of foreseeable water quality issues associated with various degrees of climate change. Once state government agencies make these lists available, they could be used to more precisely determine to what extent a project creates global climate change impacts.

Toxic Air Contaminants

Historically, the SCAQMD has regulated criteria air pollutants using either a technology-based or an emissions limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of toxic air contaminants (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.

Control of TACs Under the TAC Identification and Control Program

California's TAC identification and control program, adopted in 1983 as AB1807, is a two-step program in which substances are identified as TACs, and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 188 federal hazardous air pollutants (HAPs) as TACs.

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

Under California law, a federal National Emission Standard for Hazardous Air Pollutants (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 the 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 (AB2588) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with the emissions. Facilities are phased into the AB2588 program based on their emissions of criteria pollutants or their occurrence on lists of toxic emitters compiled by the SCAQMD. Phase I consists of facilities that emit over 25 tons per year of any criteria pollutant and facilities present on the SCAQMD's toxics list. Phase I facilities entered the program by reporting their air TAC emissions for calendar year 1989. Phase II consists of facilities that emit between 10 and 25 tons per year of any criteria pollutant, and submitted air toxic inventory reports for calendar year 1990 emissions. Phase III consists of certain designated types of facilities which emit less than 10 tons per year of any criteria pollutant, and submitted inventory reports for calendar year 1991 emissions. Inventory reports are required to be updated every four years under the state law.

In October 1992, the SCAQMD Governing Board adopted public notification procedures for Phase I and II facilities. These procedures specify that AB2588 facilities must provide public notice when exceeding the following risk levels:

- Maximum Individual Cancer Risk: greater than 10 in 1 million (10×10^{-6})
- Total Hazard Index: greater than 1.0 for TACs except lead, or > 0.5 for lead

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

The SCAQMD continues to complete its review of the health risk assessments submitted to date and may require revision and resubmission as appropriate before final approval. Notification will be required from facilities with a significant risk under the AB2588 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.

Control of TACs With Risk Reduction Audits and Plans

Senate Bill (SB) 1731, enacted in 1992 and codified at Health and Safety Code §44390 et seq., amended AB2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. SCAQMD Rule 1402 - Control of Toxic Air Contaminants From Existing Sources, was adopted on April 8, 1994, to implement the requirements of SB1731.

In addition to the TAC rules adopted by SCAQMD under authority of AB1807 and SB1731, the SCAQMD has adopted source-specific TAC rules, based on the specific level of TAC emitted and the needs of the area. These rules are similar to the state's ATCMs because they are source-specific and only address emissions and risk from specific compounds and operations.

Cancer Risks from Toxic Air Contaminants

New and modified sources of toxic air contaminants in the district are subject to Rule 1401 - New Source Review of Toxic Air Contaminants and Rule 212 - Standards for Approving Permits. Rule 212 requires notification of the SCAQMD's intent to grant a permit to construct a significant project, defined as a new or modified permit unit located within 1000 feet of a school (a state law requirement under AB3205), a new or modified permit unit posing an maximum

individual cancer risk of one in one million (1×10^{-6}) or greater, or a new or modified facility with criteria pollutant emissions exceeding specified daily maximums. Distribution of notice is required to all addresses within a 1/4-mile radius, or other area deemed appropriate by the SCAQMD. Rule 1401 currently controls emissions of carcinogenic and non-carcinogenic (health effects other than cancer) air contaminants from new, modified and relocated sources by specifying limits on cancer risk and hazard index (explained further in the following discussion), respectively.

Health Effects

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

Non-Cancer Health Risks from Toxic Air Contaminants

Unlike carcinogens, for most TAC non-carcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. The California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment (OEHA) 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

The reduction of NOx emissions pursuant to the proposed amendments to Rule 1146 may affect the use, storage and transport of hazards and hazardous materials. New (or modifications to existing) air pollution control equipment (e.g., SCRs) 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 (e.g., spent catalyst modules) generated by the control equipment and may increase the quantity of ammonia used. The primary effects of PAR 1146 with respect to hazards and hazardous materials are the anticipated overall increase in the amount of ammonia injected into SCR units for controlling NOx emissions from boilers, steam generators, and process heaters; the increase of ammonia slip emissions; and the increase of spent catalyst.

Ammonia is the primary hazardous chemical identified with the proposed project. Ammonia, though not a carcinogen, can have chronic and acute health impacts. Therefore, an increase in the use of ammonia in response to the proposed project may increase the current existing risk setting associated with deliveries (i.e., truck and road accidents) and onsite or offsite spills for each of the facilities that currently use or will begin to use ammonia. Exposure to a toxic gas cloud is the potential hazard associated with this type of control equipment. A toxic gas cloud is the release of a volatile chemical such as anhydrous ammonia that could form a cloud and migrate off-site, thus exposing individuals. Anhydrous ammonia is heavier than air such that when released into the atmosphere, would form a cloud at ground level rather than be dispersed "Worst-case" conditions tend to arise when very low wind speeds coincide with the accidental release, which can allow the chemicals to accumulate rather than disperse. Though there are

facilities that may be affected by PAR 1146 and that are currently permitted to use anhydrous ammonia, for new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia. Instead, to minimize the hazards associated with ammonia used in the SCR process, aqueous ammonia, 19 percent by volume, is typically required as a permit condition associated with the installation of SCR equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and, 2) 19 percent aqueous ammonia is not on any acutely hazardous material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As a result, no new hazards from toxic clouds are expected to be associated with the proposed project.

In addition, the shipping, handling, storage, and disposal of hazardous materials inherently poses a certain risk of a release to the environment. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing the proposed project. Further, if the control option chosen by each affected facility is to install SCR, the proposed project may alter the transportation modes for feedstock and products to/from the existing facilities such as aqueous ammonia and catalyst.

Commercial catalysts used in SCRs are comprised of a base material of titanium dioxide (TiO2) that is coated with either tungsten trioxide (WO3), molybdic anhydride (MoO3), vanadium pentoxide (V2O5), or iron oxide (Fe2O3). The key hazards associated with the proposed project are the crushing of the spent catalyst and transporting it for disposal or recycling. With respect to hazards and hazardous materials, this means that there will be an increase in the frequency of truck transportation trips to remove the spent catalyst as hazardous materials or hazardous waste from each affected facility. However, facilities that have existing catalyst-based operations currently recycle the catalysts blocks, in lieu of disposal. Moreover, due to the heavy metal content and relatively high cost of catalysts, recycling can be more lucrative than disposal. Thus, facilities that have existing SCR units and choose to employ additional SCR equipment to comply with PAR 1146, in most cases already recycle the spent catalyst and subsequently may continue to do so with any additional catalyst that may be needed.

Although recycling may be the more popular consideration, it is possible that facilities may choose to dispose of the spent catalyst in a landfill. The composition and type of the catalyst will determine the type of landfill that would be eligible to handle the disposal. For example, catalysts with a metal structure would be considered a metal waste, like copper pipes, and not a hazardous waste. Therefore, metal structure catalysts would not be a regulated waste requiring disposal in a Class I landfill unless it is friable or brittle. As ceramic-based catalysts contain a fiber-binding material, they are not considered friable or brittle and, thus, would not be a regulated waste requiring disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill. In both cases, spent catalyst would not require disposal in a Class I landfill.

Based on the aforementioned information, it is likely that spent catalysts would be considered a "designated waste," which is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state (California Code of Regulations, Title 23, Chapter 3 Subparagraph 2522(a)(1)). Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. According to the Final Program EIR for the 2007 AQMP (SCAQMD, 2007), total Class III landfill waste disposal capacity in the district is

approximately 97,269 tons per day, many of which have liners and can handle Class II and Class III wastes.

Disposal of spent catalyst would typically involve crushing the material and encasing it in concrete prior to disposal. Since it is expected that most spent catalysts will be recycled and regenerated, it is anticipated that there will be sufficient landfill capacity in the district to accommodate disposal of any spent catalyst materials.

A number of physical or chemical properties may cause a substance to be hazardous, including toxicity (health), flammability, reactivity, and any other specific hazard such as corrosivity or radioactivity. Based on a hazard rating from 0 to 4 (0 = no hazard; 4 = extreme hazard) located on the Material Safety Data Sheet (MSDS) the hazard rating for silica/alumina catalyst, for example, health is rated 1 (slightly hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none). However, if nickel is deposited on the catalyst, the hazard rating is 2 for health (moderately toxic), 4 (extreme fire hazard) for flammability, 1 for reactivity (slightly hazardous if heated or exposed to water). The particular composition of the catalyst used in the SCR units, combined with the metals content of the flue gas will determine the hazard rating and whether the spent catalyst is considered a hazardous material or hazardous waste. This distinction is important because a spent catalyst that qualifies as a hazardous material could be recycled or reused by another industry (such as manufacturing California Portland cement). However, spent catalyst that is considered hazardous waste must be disposed of in a Class III landfill.

The use, storage and transport of hazardous materials are subject to numerous laws and regulations at all levels of government. The most relevant existing hazardous materials laws and regulations include hazardous materials management planning, hazardous materials transportation, hazardous materials worker safety requirements, hazardous waste handling requirements and emergency response to hazardous materials and waste incidents. Potential risk of upset is a factor in the production, use, storage and transportation of hazardous materials. Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions.

Hazardous Materials Management Planning

State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to health or the environment in the event that such materials are accidentally released. Federal laws, such as the Emergency Planning and Community-Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act or SARA, Title III) impose similar requirements. These requirements are enforced by the California Office of Emergency Services.

The Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires that any business or government agency that handles hazardous materials prepare a business plan, which must include the following (HSC §25504):

- details, including floor plans, of the facility and business conducted at the site;
- an inventory of hazardous materials that are handled or stored on the site;
- an emergency response plan; and
- a training program in safety procedures and emergency response for new employees, and an annual refresher course in the same topics for all employees.

Hazardous Materials Transportation

The United States Department of Transportation (DOT) has the regulatory responsibility for the safe transportation of hazardous materials between states and to foreign countries. DOT regulations govern all means of transportation, except for those packages shipped by mail, which are covered by the United States Postal Service (USPS) regulations. DOT regulations are contained in the Code of Federal Regulations, Title 49 (49 CFR); USPS regulations are in 39 CFR.

Every package type used by a hazardous materials shipper must undergo tests which imitate some of the possible rigors of travel. While not every package must be put through every test, most packages must be able to meet the following generic test criteria: the ability to be (a) kept under running water for one-half hour without leaking; (b) dropped, fully loaded, onto a concrete floor; (c) compressed from both sides for a period of time; (d) subjected to low and high pressure; and (e) frozen and heated alternately.

Common carriers are licensed by the California Highway Patrol (CHP) pursuant to the California Vehicle Code, §32000, which requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards. Common carriers conduct a large portion of their business in the delivery of hazardous materials.

Under the federal Resource Conservation and Recovery Act (RCRA) of 1976, the EPA set standards for transporters of hazardous waste. In addition, the State of California regulates the transportation of hazardous waste originating or passing through the state; state regulations are contained in the California Code of Regulations (CCR), Title 13. Hazardous materials are regularly removed from generating sites by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests.

Two state agencies have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies: the CHP and the California Department of Transportation (Caltrans).

The CHP enforces hazardous 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 accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identification teams at 72 locations throughout the state.

Hazardous Material Worker Safety Requirements

The California Occupational Safety and Health Administration (Cal/OSHA) and the Federal Occupational Safety and Health Administration (Fed/OSHA) are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. In California, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations.

Under the authority of the Occupational Safety and Health Act of 1970, Fed/OSHA has adopted numerous regulations pertaining to worker safety (contained in 29 CFR – Labor). 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, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. Because California has a federally-approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace (which are detailed in CCR, Title 8) include requirements for employee safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances as well as communicating hazard information related to hazardous substances and their handling. The hazard communication program also requires that MSDSs be available to employees and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and emergency evacuation training).

Both federal and state laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training must include methods in the safe handling of hazardous materials, an explanation of MSDSs, use of emergency response equipment and supplies, and an explanation of the building emergency response plan and procedures.

Chemical safety information must also be available. More detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed or defined in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be kept in accessible places. Compliance with these regulations reduces the risk of accidents, worker health effects, and emissions.

National Fire Codes (NFC), Title 45 (published by the National Fire Protection Association) 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.

While NFC Standard 45 is regarded as a nationally recognized standard, the California Fire Code (24 CCR) 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.

Hazardous Waste Handling Requirements

The RCRA created a major new federal hazardous waste regulatory program that is administered by the EPA. Under RCRA, the EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste from "cradle to grave."

RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle-to-grave" system of regulating hazardous wastes. HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous wastes.

Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements. The EPA approved California's program to implement federal regulations as of August 1, 1992.

The Hazardous Waste Control Law (HWCL) is administered by the California Environmental Protection Agency Department of Toxic Substance Control (DTSC). Under HWCL, DTSC has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes. HWCL differs little from RCRA; both laws impose "cradle to grave" regulatory systems for handling hazardous wastes in a manner that protects human health and the environment. Regulations implementing HWCL are generally more stringent than regulations implementing RCRA.

Regulations implementing HWCL list over 780 hazardous chemicals as well as 20 to 30 more common materials that may be hazardous; establish criteria for identifying, packaging and labeling hazardous wastes; prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Under both RCRA and HWCL, hazardous waste manifests must be retained by the generator for a minimum of three years. Hazardous waste manifests list a description of the waste, its intended destination and regulatory information about the waste. A copy of each manifest must be filed with DTSC. The generator must match copies of hazardous waste manifests with certification notices from the treatment, disposal, or recycling facility.

Emergency Response to Hazardous Materials and Wastes Incidents

Pursuant to the Emergency Services Act, the State has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government agencies and private persons. Response to hazardous materials incidents is one part of this plan. The Plan is administered by the state Office of Emergency Services (OES), which coordinates the responses of other agencies including EPA, CHP, the Department of Fish and Game, the Regional Water Quality Control Board (RWQCB), and local fire departments. (See *California Government Code* §8550.)

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985 (the Business Plan Law), 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 and coordination of affected government agencies and responsible parties, training, and follow-up.

CHAPTER 4

ENVIRONMENTAL IMPACTS

INTRODUCTION

The CEQA Guidelines require environmental documents to identify significant environmental effects that may result from a proposed project [CEQA Guidelines §15126.2(a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited to, the resources involved; physical changes; alterations of ecological systems; health and safety problems caused by physical changes; and other aspects of the resource base, including water, scenic quality, and public services. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible [CEQA Guidelines §15126.4].

CEQA Guidelines indicate that the degree of specificity required in a CEQA document depends on the type of project being proposed [CEQA Guidelines §15146]. The detail of the environmental analysis for certain types of projects cannot be as great as for others. For example, the environmental document for projects, such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan, should focus on the secondary effects that can be expected to follow from the adoption or amendment, but the analysis need not be as detailed as the analysis of the specific construction projects that might follow. As a result, this Final ~~Draft~~ EA analyzes impacts on a regional level and impacts on the level of individual industries or individual facilities only where feasible.

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

POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Pursuant to CEQA, an Initial Study, including an environmental checklist, was prepared for this project (see Appendix C). Of the 17 potential environmental impact categories, only two (air quality and hazards/hazardous materials) were identified as being potentially adversely affected by the proposed project. One comment letter was received on the Initial Study. The comment letter and responses to the comments can be found in Appendix D of this document.

The two environmental impact areas that were identified as potentially significant in the Initial Study are further evaluated in detail in this Final ~~Draft~~ EA. The environmental impact analysis for each environmental topic incorporates a "worst-case" approach. This approach entails the premise that whenever the analysis requires that assumptions be made, 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 environmental impacts associated with the implementation of the proposed project.

SCAQMD staff is proposing amendments to Rule 1146 to achieve additional NOx emission reductions consistent with the 2007 AQMP Control Measure CM#2007MCS-01: Facility Modernization and to comply with all feasible measures specified in the July 2006 demonstration to the EPA that SCAQMD's current air pollution rules fulfill the 8-hour ozone RACT standards. Since NOx is a precursor pollutant to both ozone and fine particulate matter as PM10 and PM2.5, amendments are proposed to address BARCT and BACT requirements, which may require installation or modification of NOx emission control equipment. The proposed amendments to Rule 1146 will reduce the allowable NOx emission limits from 30 ppm to 12 ppm, nine ppm, or five ppm, depending on equipment size and operational characteristics. The proposed amendments to Rule 1146 would also include NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes are proposed that include: 1) establishing annual tune-up procedures and monthly maintenance procedures; 2) allowing equipment to be de-rated at no less than two mmBTU/hr; and, 3) allowing a 30 ppm NOx compliance limit for low fuel usage equipment by January 1, 2015, or until burner replacement, whichever occurs later. Other minor changes are proposed to improve organization, clarity and consistency throughout the rule.

As shown in Table 4-1, of the entire rule amendment package, only the amendments proposed that pertain to reducing the allowable NOx emission limits for Group I, II and III equipment units are expected to involve physical changes at affected facilities which may cause potentially significant adverse "air quality" and "hazards and hazardous materials" impacts. Therefore, the type of emission reduction projects that may be undertaken to comply with PAR 1146, primarily the installation of ultra-low NOx burners or SCR systems on existing boilers, steam generators and process heaters, are the main focus of the analysis in this Final ~~Draft~~ EA.

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 systems equipment at existing stationary combustion sources to reduce NOx emissions. To optimize their equipment overall, facility owner/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.

Implementation of PAR 1146 is expected to contribute to the overall improvement of air quality in the region by reducing NOx emissions by 1.17 tons per day by 2016 from affected sources. With the affected sources meeting the requirements of PAR 1146, the proposed project will be consistent with the overall goals and objectives of the 2007 Final AQMP to improve air quality in the Basin. Therefore, PAR 1146 will contribute to the emission reduction goals of the AQMP and will assist the Basin in maintaining the state and national ambient air quality standards for NO2 and attaining the state and national ambient air quality standards for ozone, PM10, and PM2.5.

Table 4-1
Summary of Key Components in PAR 1146

Group Unit No.	Equipment Rating mmBTU/hr	Fuel Type	Current NOx Limit	Proposed NOx Limit	NOx Emission Reductions per Unit
I	≥ 75	natural gas	30 ppm or 0.036 lb/mmBTU	5 ppm or 0.0062 lb/mmBTU	25 ppm or 0.0298 lb/mmBTU
II	≤ 20 x < 75	gaseous, but excluding landfill & digester gases	30 ppm or 0.036 lb/mmBTU*	Standard: 9 ppm or 0.011 lb/mmBTU* Enhanced: 5 ppm or 0.0062 lb/mmBTU*	Standard: 21 ppm or 0.025 lb/mmBTU* Enhanced: 25 ppm or 0.0298 lb/mmBTU*
III	≤ 5 x < 20 (includes units operated at schools & universities that are rated ≤ 5 mmBTU/hr)	gaseous, but excluding landfill & digester gases	30 ppm or 0.036 lb/mmBTU*	9 ppm or 0.011 lb/mmBTU*	21 ppm or 0.025 lb/mmBTU*
III	≤ 10	natural gas-fired atmospheric units	30 ppm or 0.036 lb/mmBTU*	12 ppm or 0.015 lb/mmBTU*	18 ppm or 0.021 lb/mmBTU*
Any	≤ 90,000 therms/yr	Any fuel	≤ 90,000 therms/yr (60 ppm)	30 ppm	30 ppm
Any	Any	landfill gas	30 ppm	25 ppm	5 ppm
Any	Any	digester gas	30 ppm	15 ppm	15 ppm

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.

AIR QUALITY

PAR 1146 proposes to reduce the allowable NOx emission limits for boilers, steam generators and process heaters from 30 ppm to 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. PAR 1146 will also propose NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. PAR 1146 is estimated to reduce approximately 1.17 tons per day of NOx emissions by 2016. 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 national ambient air quality standards for ozone, PM10, and PM2.5. However, the implementation of the proposed project to reduce NOx could create both direct and indirect air quality impacts from those sources that install ultra-low NOx burners or SCR systems.

The portion of the proposed project that is the main focus of this analysis is related to the installation and operation of these NOx controls. Potentially significant impacts that may result from implementing PAR 1146 are related to the construction activities associated with installing the NOx controls. The following types of combustion equipment categories could undergo

physical modifications in order to comply with the PAR 1146 requirements to reduce NOx: 1) boilers; 2) steam generators; and 3) process heaters.

To comply with PAR 1146, operators of affected facilities may consider retrofitting existing combustion equipment with NOx control equipment to further reduce NOx emissions. Specifically, the physical changes involved with the type of construction activities that may occur focus mainly on the modification of existing equipment by installing ultra-low NOx burners or SCR systems along with any other burner and flue gas configurations that may improve the efficiency of the combustion process, thus, reducing NOx emissions. Of the differing control equipment likely to be installed or modified, past projects involving SCR 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 Final ~~Draft~~ EA. 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. 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 toxic air contaminant, the installation of ammonia storage tanks must also be considered when evaluating the overall construction and operational activities. The potential impacts for both types of NOx control are discussed separately in the following section.

Air Quality Significance Criteria

To determine whether or not air quality impacts from adopting and implementing the proposed amendments to Rule 1146 are significant, impacts will be evaluated and compared to the following criteria. If impacts exceed any of the significance thresholds in Table 4-2, they will be considered significant. All feasible mitigation measures will be identified and implemented to reduce significant impacts to the maximum extent feasible. The project will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 4-2 are equaled or exceeded.

Air Quality Impacts

Based on the proposed NOx emission limits as outlined in Table 4-1, PAR 1146 is expected reduce 1.17 tons per day of NOx emissions by 2016 from approximately 1,068 boilers, steam generators, and process heaters that individually have a total rated heat input at five mmBTU/hr or higher. In order to achieve the overall net air quality benefit from implementing PAR 1146, some of the affected facility operators may choose to modify existing equipment by retrofitting with air pollution control equipment in order to comply with the lowered NOx emission standards.

As discussed in Chapter 3 of this Final ~~Draft~~ EA, based on an evaluation of facilities that would be subject to the proposed NOx limits in PAR 1146 and that could potentially retrofit their existing combustion equipment with NOx controls, for Group I equipment, there are only five facilities operating eight boilers rated greater than 75 mmBTU/hr each (i.e., "Group I units") that do not currently have NOx retrofit control technology in place. These units would be required to achieve the most stringent of the proposed emission limits in PAR 1146 of five ppm NOx or 0.0062 lb/mmBTU NOx by January 1, 2013. To achieve the proposed emission limit of five ppm NOx, retrofitting these units with ultra-low NOx burners alone will not meet this goal.

Instead, facility owners/operators would likely need to consider installing SCR systems as this technology can reduce NOx emissions below five ppm.

Table 4-2
Air Quality Significance Thresholds[4]

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants and Odor Thresholds		
Toxic Air Contaminants (TACs) Accidental Release of Acutely Hazardous Materials (AHMs)	MICR $\geq$ 10 in 1 million ; HI $\geq$ 1.0 (project increment) CAA §112(r) threshold quantities	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants **(a)**		
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour average annual geometric average annual arithmetic mean	10.4 $\mu g/m^3$ (construction) **(b)** & 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$ 20 $\mu g/m^3$	
PM2.5 24-hour average	10.4 $\mu g/m^3$ (construction) **(b)** & 2.5 $\mu g/m^3$ (operation)	
Sulfate 24-hour average	1 ug/m^3	
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) 9.0 ppm (state/federal)	

(a) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

(b) Ambient air quality threshold based on SCAQMD Rule 403.

KEY: MICR = maximum individual cancer risk; HI = Hazard Index; ug/m^3 = microgram per cubic meter; ppm = parts per million; AHM = acutely hazardous material; TAC = toxic air contaminant

PAR 1146 proposes that Group II units would have a standard NOx emission limit of nine ppm, with full compliance achieved by January 1, 2012 for 75 percent of the units, and by January 1, 2014 for 100 percent of the units. PAR 1146 also has an enhanced, more stringent, NOx

[4] CEQA Air Quality Handbook, SCAQMD, November 1993.

emissions limit proposed for Group II units at five ppm, with more time allowed to achieve full compliance, by January 1, 2014 for 75 percent of the units, and by January 1, 2016 for 100 percent of the units. The majority of Group II equipment, as previously discussed in Chapter 3, under the standard compliance scenario is also considered a potential candidate for installing ultra-low NOx burners, while SCR systems would be installed for Group II units complying with the enhanced NOx emission limit.

To estimate the number of Group II units that would comply with the enhanced NOx emission limit of five ppm, source test compliance data from the SJVUAPCD could be an indicator of potential SCR installations. The SJVUAPCD conducted 260 source tests on Group II equipment operating in their jurisdiction and 93 percent of the units tested were able to achieve compliance with an ultra-low NOx burner, while the remaining seven percent needed SCR. Of those seven percent, only five percent of the equipment tested would be required to comply with Rule 1146 if operated in the district instead of the SJVUAPCD area of jurisdiction. Based on these data, a conservative estimate of the number of units that would not be able to achieve the nine ppm NOx limit via ultra-low NOx burners would be five percent, or nine units. Therefore, this analysis assumes that nine of the 173 units in Group II would instead opt for the enhanced compliance limit of five ppm NOx via the use of SCR technology.

Lastly, PAR 1146 proposes that Group III sealed units would have a nine ppm NOx emission limit and atmospheric units would have a 12 ppm NOx emission limit. To achieve these limits, retrofitting the 739 units in Group III with ultra-low NOx burners is expected to meet this goal, without the need for SCR technology.

In summary, approximately 17 units from Groups I and II (eight in Group I plus nine in Group II) are potential candidates for SCR retrofits while the remaining 1,051 units subject to PAR 1146 are potential candidates for installing ultra-low NOx burners (refer to Chapter 3 – Existing Setting). Consequently, reducing NOx emissions from these combustion units will provide an air quality benefit in the near- and long-term. Direct air quality impacts resulting from the proposed amendments to Rule 1146 would result from the reduction of NOx at affected facilities, which will provide air quality and human health benefits to the public.

It is important to note that PAR 1146 facility operators may first consider employing ultra-low NOx burners for the boilers, steam generators and process heaters due to the relative ease of installation, operation, control efficiency and overall cost when compared to SCRs. In addition, for those units that may not be able to achieve the lowered NOx limits proposed in PAR 1146 via ultra-low NOx burners, the environmental analysis assumes that installation of SCR technology will reduce NOx emissions overall, but the installation of these units will result in adverse air quality impacts during construction.

Facility operators are expected to install add-on air pollution control equipment in order to reduce NOx emissions as required by PAR 1146. However, the installation and operation of add-on air pollution control equipment such as SCR can potentially create secondary or indirect air quality impacts (e.g., emissions), which can adversely affect local and regional air quality. A project generates emissions both during the period of its construction and through ongoing daily operations. During installation of add-on air pollution control devices, emissions may be generated by onsite construction equipment and by offsite vehicles used for worker commuting. After construction activities are completed, emissions may be generated by the operation of the add-on air pollution control devices (as ammonia slip) and offsite vehicles used for delivering

fresh materials needed for operations (fresh catalyst and aqueous ammonia) and hauling away spent catalyst.

The air quality analysis in this document focuses on the installation of SCR equipment because experience with similar projects involving SCR installation have typically resulted in the greatest amount of construction emissions for an individual project. In lieu of complying with the lowered NOx limits in PAR 1146 via ultra-low NOx burners or SCR technology, facility operators may choose to de-rate the existing unit to no less than two mmBTU/hr per unit. Because, de-rated units would be subject to the requirements in Rule 1146.1 instead of Rule 1146, the potential effects of operators de-rating units were not analyzed in this Final ~~Draft~~ EA.

To estimate the "worst-case" construction- and operational-related emissions associated with installing ultra-low NOx burners or SCR in order to implement PAR 1146, 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. Refer to Appendix B for the assumptions used to estimate secondary construction- and operational-related air quality impacts.

The summary in Table 4-3 shows that PAR 1146 is expected to result in direct air quality benefits from the anticipated NOx emission reductions of approximately 1.17 tons per day from installing ultra-low NOx burners and SCR units on affected equipment. Depending on the equipment rating and corresponding compliance date combined with when construction would need to begin, the emission reductions from all PAR 1146 sources are expected to occur between January 1, 2011 and January 1, 2016.

To achieve the anticipated NOx emission reductions from implementing PAR 1146, installing ultra-low NOx burners or SCR systems would be necessary. To install applicable air pollution control technologies, construction activities are anticipated to be involved. From a construction point of view, the installation of ultra-low NOx burners on 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 75 mmBTU/hr with SCRs. 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 general assumptions were made:

- 164 Group II units will be retrofitted with ultra-low NOx burners, with 75 percent (123) occurring in 2011 and 100 percent completed by the end of 2013.
- 739 Group III units (614 are sealed units and 125 are atmospheric units) will be retrofitted with ultra-low NOx burners with 75 percent (461) of the sealed units occurring

in 2012 and the remaining completed by the end of 2014; and, 100 percent (125) of the atmospheric units occurring in 2013.

- 133 low usage units (i.e., units using less than or equal to 90,000 therms annually), nine landfill gas units, and nine ~~six~~ digester gas units, will be retrofitted with ultra-low NOx burners in 2014.
- 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 in the same day.
- One contractor/vendor plus one welder per unit will be needed to retrofit with ultra-low NOx burners.

Table 4-3
Anticipated Distribution of NOx Emission Reductions for PAR 1146

Group Unit No.	Equipment Rating & Fuel Type	Current NOx Limit	Proposed NOx Limit	NOx Emission Reductions per Unit	No. of Units	Total NOx Emission Reductions (ton/day)
I	≥ 75 mmBTU/hr; natural gas	30 ppm or 0.036 lb/mmBTU	5 ppm or 0.0062 lb/mmBTU	25 ppm or 0.0298 lb/mmBTU	8	0.16 by 01/01/13
II	≤ 20 x < 75 mmBTU/hr; gaseous fuel but not landfill & digester gas	30 ppm or 0.036 lb/mmBTU*	Standard: 9 ppm or 0.011 lb /mmBTU* Enhanced: 5 ppm or 0.0062 lb /mmBTU*	Standard: 21 ppm or 0.025 lb /mmBTU* Enhanced: 25 ppm or 0.0298 lb /mmBTU *	173	0.54 distributed as follows: Standard Compliance: 0.38 (75%) by 01/01/12 and 0.51 (100%) by 01/01/14 Enhanced Compliance: 0.025 (75%) by 01/01/14 and 0.033 (100%) by 01/01/16
III	≤ 5 x < 20 mmBTU/hr includes units operated at schools & universities that are rated ≤ 5 mmBTU/hr; gaseous fuel but not landfill & digester gas	30 ppm or 0.036 lb/mmBTU*	9 ppm or 0.011 lb /mmBTU*	21 ppm or 0.025 lb/mmBTU*	614	0.29 distributed as follows: 0.22 (75%) by 01/01/13 0.29 (100%) by 01/01/15
III	≤ 10 for natural gas-fired atmospheric units	30 ppm or 0.036 lb/mmBTU*	12 ppm or 0.015 lb /mmBTU*	18 ppm or 0.021 lb/mmBTU*	125	0.05 by 01/01/14
--	≤ 90,000 therms/yr; Any fuel	60 ppm	30 ppm	30 ppm	133	0.06 by 01/01/15 or later
--	Any Units; landfill gas	30 ppm	25 ppm	5 ppm	9	0.04 by 01/01/15
--	Any Units; digester gas	30 ppm	15 ppm	15 ppm	9~~6~~	0.02 by 01/01/15

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.

Refer to Appendix B for the construction estimates for installing ultra-low NOx burners on the affected equipment.

Relative to what is required for the installation for ultra-low NOx burners, retrofitting boilers, steam generators and process heaters with SCR may involve heavy-duty construction equipment, major construction activities and operational maintenance requirements depending on the type of SCR being installed and, as such, is the core of the analysis in this Final ~~Draft~~ EA.

The overall objective of PAR 1146 is to reduce NOx. However, in consideration of the complexity involved with operating boilers, steam generators, and process heaters, the equipment operators utilize a combination of various emission control equipment and techniques to control not only NOx, but CO, SOx, PM10, and ammonia slip, as applicable, while maintaining overall efficiency.

As there is no way to fully predict on a case-by-case basis what each facility operator will do to comply with PAR 1146, this analysis will limit its focus on controlling NOx emissions via the use of SCR because past projects[5] involving the installation of SCR on large units have typically resulted in the greatest amount of construction and operational emissions and, thus, represents the "worst-case."

Approximately 17 equipment units (eight from Group I and nine from Group II) represent the maximum number of potential SCR units with ammonia tanks expected to be installed on existing boilers, steam generators and process heaters subject to PAR 1146. The remaining 1,051 units are anticipated to be retrofitted with ultra-low NOx burners.

When considering the retrofit of an existing unit with SCR technology, six months is estimated to be the typical amount of time it would take to assess the affected equipment, decide on the appropriate control technology relative to a new, compliant unit, order the necessary parts, line up contractors/workers, and prepare the affected unit for shutdown. However, facility owners/operators of Group I equipment will be required to obtain a permit to construct by January 1, 2012 in order to comply with PAR 1146 by January 1, 2013. Further, prior to receiving any permit to construct, a site-specific CEQA analysis in addition to this Final ~~Draft~~ EA may also be necessary depending on how much construction (i.e., demolition, site grading, etc.) would be involved and the number of units located at one site. For these reasons, the timing of constructing eight SCRs for Group I units is conservatively estimated to occur in one year, throughout 2012.

Similarly, the owners/operators of Group II units that would install SCR to comply with the enhanced compliance option (by as early as January 1, 2014 for 75 percent of the units or as late as January 1, 2016 for 100 percent of the units) would have the same type of engineering, permitting and CEQA issues as well as similar construction activities and times as the Group I units. However, the earliest date Group II units under the enhanced compliance option would be required to obtain a permit to construct is by January 1, 2013 (one year later than Group I units). Even though there is a provision that allows the remaining 25 percent of Group II units

[5] The following projects have been used as references for construction projects: 1) Negative Declaration for: ConocoPhillips Los Angeles Refinery Carson Plant SCR Unit Project; January 14, 2004. 2) Equilon Enterprises, LLC Los Angeles Refinery CARB Phase 3 Proposed Project Final Environmental Impact Report; October 2001. 3) Final Environmental Impact Report for Los Angeles Department of Water and Power's Installation of Five Combustion Turbines at the Harbor Generating Station, Installation of Three Selective Catalytic Reduction Systems at the Scattergood Generating Station, and the Installation of One Combustion Turbine at the Valley Generating Station; January 2001. 4) Final Negative Declaration of BP Carson Refinery Fluid Catalytic Cracking Unit NOx Reduction Project; March 2002. 5) Final Environmental Impact Report for Chevron – El Segundo Refinery California Air Resources Board (CARB) Phase 3 Clean Fuels Project; November 2001.

complying with the enhanced option to apply for a permit to construct by January 1, 2015, it is more conservative to assume that 100 percent of the Group II units (i.e., nine) complying with the enhanced option will have construction of the SCRs occurring in one year, throughout 2013.

Since SCR utilizes ammonia in the NOx reduction process, as many as one aqueous ammonia storage tank per SCR installation (i.e., 17 ammonia storage tanks) could potentially be installed to support the new SCR units for the affected boilers, steam generators, and process heaters. However, of the eight Group I units that are expected to utilize SCR technology, three are located within the same facility and, thus, could to install one larger aqueous ammonia storage tank, rather than three smaller tanks, to service three SCR units. For the purpose of conducting a "worst-case" analysis and to maximize the potential air quality impacts, the construction of one new ammonia storage tank is assumed per SCR installation.

Therefore, for the purpose of a "worst-case" analysis, a total of 17 new ammonia storage tanks are assumed to be installed as part of the SCR retrofits for eight Group I units and nine Group II units. In actuality, each facility operator's decision about whether to install an ammonia tank as part of the SCR retrofits will likely take into account the existing ammonia storage and delivery infrastructure, if any, at each affected facility, such as whether ammonia injection is currently utilized for other SCR systems in use at the facility. However, since it is difficult to predict what each facility owner/operator will do, in reality, the actual number of ammonia storage tanks to be installed will be case-by-case and will depend on available space, location of the affected equipment and the proximity to the existing or new ammonia storage and distribution infrastructure.

To conduct a conservative "worst-case" analysis, this document examines the possibility that the affected facility operators will install SCR units, including but not limited to exhaust stacks, as applicable, ammonia injection systems including ammonia storage tanks and associated piping designs, plus other ancillary equipment, as applicable. As a practical matter, construction activities that are anticipated to occur as a result of implementing PAR 1146 would likely occur prior to a scheduled maintenance of the affected unit.

To install SCR, approximately six months are needed to construct each SCR with a separate aqueous ammonia storage tank. The construction activities involved with installing one SCR unit, storage tank, and ancillary equipment such as piping and pumps, could potentially overlap. Ultimately, the action taken and type of NOx control equipment to be installed in response to PAR 1146 will depend on each facility's individual operational needs as well as space availability on-site.

As shown in Table 4-4, to install eight SCR units for eight Group I boilers, steam generators and process heaters between January 1, 2012 and January 1, 2013, the maximum number of SCR units that may be constructed during any six-month period for a worst-case analysis is eight. Similarly, to construct nine SCR units for nine Group II boilers, steam generators and process heaters under the enhanced compliance option between January 1, 2013 and January 1, 2014, the maximum number of SCR units that may be constructed during any six-month period for a worst-case analysis is nine.

Typically construction projects have staggered construction schedules which take into account design and engineering, ordering and purchasing equipment, permitting and environmental review, the availability of construction crews, budgeting, and any other construction projects on

site. However, since it can take up to six months to construct SCR for a large (i.e., Group I) boiler, steam generator or process heater, the construction activities of Group II units could start earlier and overlap with construction of Group I units. Even with this overlap, the worst-case scenario would be if there was no construction overlap between the two groups. As such, this analysis assumes that there will be no overlapping construction between the two groups. Thus, this analysis assumes that within any six-month construction period a maximum of nine SCR units with nine new ammonia storage tanks could be under construction at any one time.

However, the construction activities associated with installing SCRs are expected and have the potential to generate significant adverse secondary air quality impacts. Consequently, reducing the quantity of NOx emissions from these facilities will provide an air quality benefit in the long term. It should be noted that the NOx emission reduction benefits obtained early on in the program will overlap the period of construction involving the installation of SCRs and ammonia storage tanks.

Table 4-4
Summary of Construction Periods for Units Affected by SCR & Ammonia Tank Construction

	Projected Number of Units Affected by SCR & Ammonia Tank Construction		
Group Number	**Number of Units Needing SCR**	**Construction Period**	**"Worst-case" Construction During Any 6-Month Period**
I	8	Application for a Permit to Construct needs to be submitted by 01/01/12 with Final Compliance by 01/01/13 (1 year)	8
II	9	75% of units (Enhanced Compliance): Application for Permit to Construct needs to be submitted by 01/01/13 with Final Compliance by 01/01/14 (1 year) 100% of units: Application for Permit to Construct needs to be submitted by 01/01/15 with Final Compliance by 01/01/16 (1 year)	7 + 2 9

Assumptions Based on Incremental Number of SCRs

To estimate conservative "worst-case" construction- and operational-related emissions associated with the implementation of PAR 1146, the following assumptions were made. Please see Appendix B for the calculation assumptions used to estimate secondary construction- and operational-related air quality impacts. Of the units affected by PAR 1146, the following general assumptions were made:

- Though other possible air pollution control devices and control techniques discussed in the 'Technology Overview' section in Chapter 2 of this document may be effective in controlling NOx, with the exception of SCR these technologies may not necessarily be able to comply with the applicable NOx limits in PAR 1146. Further, based on past projects involving SCRs, SCR technology is also the equipment most likely to have the greatest secondary environmental impacts during construction and operation. To conduct a "worst-case" analysis, SCRs are assumed to be the only control equipment able to achieve a five ppm NOx limit for boilers, steam generators and process heaters.

- To estimate the amount of excess ammonia that would needed to achieve a five ppm NOx limit, a stoichiometric ratio of 1.0 mole NOx to 1.05 moles of NH3 and a load factor of 70 percent is assumed. In addition a "worst-case" control efficiency of 70 percent is assumed, even though SCRs have been shown to achieve 90 percent.
- A "worst-case" of eight Group I units and nine Group II units are assumed to be retrofitted with SCR systems, which include, the installation of new aqueous ammonia storage and delivery systems. The installations are assumed to be constructed during the peak construction period.
- SCAQMD permitting policy requires the use of aqueous ammonia at 19 percent dilution and five ppm ammonia slip corrected for three percent oxygen for SCR units.
- Taking into consideration CEQA planning and SCAQMD permitting requirements when deriving the peak construction-related emissions, the construction activities are expected to occur between January 1, 2012 and January 1, 2013 for Group I units and between January 1, 2013 and January 1, 2014 for Group II units to provide a conservative "worst-case" scenario.

In addition, based on past experience with construction and operational data from previously analyzed projects, the following assumptions were made for the construction and operational phases:

Assumptions for Phase I – Construction of New SCRs and Ammonia Tanks

- Construction activities for retrofitting boilers, steam generators and process heaters with SCR units are assumed to take approximately six months (five days per week at 10 hours per day) with a crew of 20 workers. This construction schedule includes the time needed to install the ammonia storage tanks and ancillary equipment.
- The construction of each SCR retrofit for a boiler, steam generator, or process heater (including any associated ammonia tank and ancillary equipment as appropriate) is assumed to require the use of one rough terrain crane, two welding machines, one air compressor, one backhoe, one plate compactor, one forklift, one concrete pump, one concrete saw, one generator, one aerial (man) lift, one flatbed truck, one delivery truck, one watering truck and one pickup truck.
- The initial construction of one SCR unit is assumed to require two one-way truck deliveries of catalyst modules.
- 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. Based on estimated NOx emission reductions from Group I units, the maximum size storage tank that would be needed is 500 gallons, per SCR unit. Similarly, for Group II units, the maximum size storage tank that would be needed is 100 gallons, per SCR unit.
- Since the ammonia tanks will be pressurized, no ammonia emissions are expected from filling the storage tanks.
- To provide a "worst-case" analysis, it is assumed that each SCR project will have its own construction crew and equipment, even though it may be possible that a single construction crew and their equipment could work on more than one project at a time at a facility that has multiple units undergoing SCR installations.

Assumptions for Phase II – Operation of New SCRs and Ammonia Tanks

- Approximately every five years, the spent catalyst will need to be hauled off-site for recycling or disposal and fresh catalyst will need to be delivered. Per SCR unit installed, two one-way truck trips are assumed for retrieving the spent catalyst and hauling off-site and two additional one-way truck trips are assumed to deliver fresh catalyst modules. Since catalyst replacements will be spread out over a five-year period among all of the new SCR units, the "worst-case" delivery scenario would be that two facilities could replace the catalyst on the same day.
- Depending on the operational loading, each new aqueous ammonia tank will need to be filled on a regular basis. The capacity of one aqueous ammonia tank truck is approximately 7,000 gallons per delivery. The frequency of deliveries for aqueous ammonia will vary by tank capacity (which is expected to be between 100 and 500 gallons per month based on estimates calculated from NOx emission reduction criteria and outlet NOx and ammonia slip limitations. However, for the purpose of this analysis, 17 ammonia storage tanks servicing 17 SCRs for a combination of boilers, steam generators and process heaters will need ammonia delivered via one-way truck deliveries for each new ammonia storage tank one time per month. The "worst-case" ammonia delivery scenario would be that 17 trucks would be needed to refill all 17 new ammonia tanks within one five-day period at a maximum of 500 gallons per tank for Group I units and 100 gallons per tank for Group II units.
- Since the ammonia tanks will be pressurized, no ammonia emissions are expected from refilling the storage tanks.

Construction Emissions

Construction-related emissions can be distinguished as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NOx, SOx, CO, VOC, PM2.5 and PM10) from heavy-duty construction equipment operation, fugitive dust (primarily as PM10) from disturbed soil, and VOC emissions from asphaltic paving and painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (primarily as PM10) from worker commute trips, material delivery trips, and haul truck material removal trips to and from the construction site.

In general, limited construction emissions from grading are anticipated because the sites, typically, have already been graded and paved. Further, operators at each affected facility who construct a new ammonia storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release. Because of space limitations within each affected facility, installation of the new SCRs is likely to occur on the same foundation as the equipment the SCRs will be servicing. Though there may be the need to build footings for the new SCRs depending on the location with the property, no other digging, earthmoving, grading, slab pouring, or paving activities are anticipated.

The type of construction-related activities attributable to installing new SCRs would consist predominantly of deliveries of steel, catalyst modules, aqueous ammonia, and other materials, maneuvering the materials within the site via a crane, forklift or truck, and welding. 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.

PROJECT-SPECIFIC IMPACTS: The implementation of PAR 1146 is anticipated to trigger construction activities associated with the installation of new SCRs and ammonia storage tanks. Construction activities associated with the proposed project would result in emissions of VOC, NOx, SOx, CO and PM10. Significance determinations are based on the maximum daily emissions during the construction period for either the eight Group I units or the nine Group II units potentially affected by the proposed project, which provides a "worst-case" analysis of the anticipated construction emissions. Construction emissions are expected from the following equipment and processes:

- Construction equipment (i.e., fork lifts, cranes, dump trucks, backhoes, welders, etc.)
- Equipment delivery and on-site travel (includes fugitive dust associated with travel on paved roads)
- Heavy-duty diesel trucks
- Construction workers commuting
- Fugitive dust associated with building ammonia containment berms

Using a 1.0 average vehicle ridership, the construction worker labor force would be approximately 20 workers for retrofitting one boiler, steam generator or process heater with one SCR. Each worker would generate two one-way vehicle trips per day. Construction worker's travel emissions are based on assuming an estimated 25-mile round trip each day per vehicle (two start-ups per day). For constructing one SCR for a Group I unit, the total daily construction workers' travel emissions are approximately 0.80 pound of VOC, 7.65 pounds of CO, 0.78 pound of NOx, 0.01 pound of SOx, 0.09 pound of PM10, and 0.06 pound of PM2.5. The total daily emissions that would be attributed to all construction-related activities for one SCR system on a Group I unit are approximately six pounds of VOC, 27 pounds of CO, 37 pounds of NOx, 0.06 pound of SOx, five pounds of PM10, and one pound of PM2.5. These numbers include the truck emissions associated with delivering fresh catalyst modules and delivering the aqueous ammonia to initially fill the storage tanks. Peak construction emissions from the proposed project are expected to occur during year 2012 for Group I units because PAR 1146 requires the operators of these units to apply for a permit to construct by January 1, 2012 and to achieve full compliance by January 1, 2013. Similarly for Group II units, peak construction emissions from the proposed project are expected to occur during year 2013 for 75 percent of the units because the enhanced compliance option only requires a portion of the total number of units to obtain a permit to construct by January 1, 2013.

Tables 4-5 and 4-6 present the results of the SCAQMD staff's construction air quality analysis and lists the total daily construction emissions from construction worker trips and use of equipment for the installation of eight SCRs for eight Group I units and nine SCRs for nine Group II units, respectively. The calculations show the emissions distribution associated with the construction of a new SCR system with ammonia tank for Group I units with 25 percent overlap (two units), 50 percent overlap (four units), 75 percent overlap (six units), and 100 percent overlap (all eight units). At the point where there is a 50 percent overlap with four units under construction at any one time, the total daily construction emissions exceed the SCAQMD's CEQA air quality significance threshold of 100 pounds of NOx per day. No other pollutants exceed their applicable significance thresholds under any of the scenarios.

Similarly, the calculations for the construction of a new SCR system with an ammonia tank for Group II units at 50 percent overlap (five units) show that the total daily construction emissions exceed the SCAQMD's CEQA construction air quality thresholds of 100 pounds per day of

NOx. Therefore, prior to any mitigating factors, construction air quality impacts for NOx are considered to be significant for NOx beginning at 50 percent overlap for the construction of SCRs on both Group I and Group II units. No other pollutants exceed their applicable significance thresholds under any of the scenarios. Appendix B contains the spreadsheets with the results and assumptions used by the SCAQMD staff for this analysis.

Although Tables 4-5 and 4-6 show that the peak daily NOx construction emissions exceed the construction significance threshold due to construction overlap since construction is assumed to occur during a one-year period, construction NOx emissions are determined to be insignificant for the following reasons. Past and current SCAQMD policy recommends that if construction and operational phase impacts overlap, impacts from each phase should be summed and then compared to the applicable significance thresholds.[6] Although the proposed project will generate NOx emissions during construction and operational phases, these emission increases will be offset by NOx emission reductions that will occur through implementation of the proposed project. Construction of SCR systems for eight Group I units in 2012 will reduce NOx by 0.16 tons per day or 322 pounds per day by January 1, 2013. In the unlikely scenario that all eight Group I units are undergoing simultaneous construction, the estimated NOx reductions of 322 pounds per day will easily offset the maximum of 304 pounds per day of NOx (296 pounds from SCR installation and 8 pounds from ultra-low NOx burner retrofits) that would be attributed to temporary, simultaneous construction impacts.

Similarly, for the second tier of PAR 1146 or construction of SCR systems on nine Group II units in 2013 is estimated to reduce NOx by 0.03 ton per day or 67 pounds per day by the end of 2013 at the earliest, since enhanced compliance is not required for 100 percent of the units until January 1, 2016. It is important to keep in mind that PAR 1146 would allow facility operators to have 75 percent of the eligible equipment comply with the Group II enhanced compliance option by January 1, 2014, with the remainder achieving full compliance by January 1, 2016. For this reason, not all nine Group II units are expected to be under construction in 2013 and further, of the portion that is under construction, not all will likely be under construction at the same time. This means that the worst-case construction scenario would be if there was an overlap of construction activities at 75 percent or NOx emissions attributable to construction at 230 pounds per day. Nonetheless, in consideration of the NOx emission reductions that will be in effect by 2013 from the Group I units (322 pounds per day), plus the emission reductions that would result from installing of ultra-low NOx burners on 164 Group II units beginning in 2011 (771 pounds per day) and continuing through 2014 (1,028 pounds per day), the temporary construction emissions from installing SCRs on the select Group II units will be fully offset.

[6] Examples of SCAQMD's policy regarding emissions calculation procedures for determining significance when construction and operational phases overlap can be found in comment letters prepared in response to the following Intergovernmental Review Projects: 1) Supplement to the Draft Environmental Impact Statement/Report for the Los Angeles International Airport Proposed Master Plan, Mr. David B. Kessler, November 7, 2003; 2) Recirculated Draft Supplemental Environmental Impact Report: West Channel/ Cabrillo Marina Phase II, Mr. Ralph G. Appy, January 30, 2003; 3) Draft Environmental Impact Report for the Grace Ministries International Master Plan, Ms. Joan Wolff, November 7, 2002.

Table 4-5
Peak Daily "Worst-Case" Concurrent Construction
Emissions for Building SCR Systems on Group I units in 2012

Peak Construction Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Phase 1a: Fugitive Dust from Berm Construction for NH3 Storage Tank	0	0	0	0	2.56	0.54
Phase 1b: Construction Equipment and Vehicles (including worker trips)	4.74	22.61	24.68	0.04	1.71	0.26
Phase 2: Deliver Catalyst and NH3 to initially fill tank	1.01	4.09	12.37	0.02	0.60	0.52
Total for 1 SCR Installation	**6**	**27**	**37**	**0**	**5**	**1**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Total for 2 SCR Installations (assumes 25% overlap)	**12**	**53**	**74**	**0**	**10**	**3**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Total for 4 SCR Installations (assumes 50% overlap)	**23**	**107**	**148**	**0**	**19**	**5**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Total for 6 SCR Installations (assumes 75% overlap)	**35**	**160**	**222**	**0**	**29**	**8**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Total for 8 SCR Installations (assumes 100% overlap)	**46**	**214**	**296**	**0**	**39**	**11**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**

Table 4-6
Peak Daily "Worst-Case" Concurrent Construction
Emissions for Building SCR Systems on Group II units in 2013

Peak Construction Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Phase 1a: Fugitive Dust from Berm Construction for NH3 Storage Tank	0	0	0	0	2.56	0.54
Phase 1b: Construction Equipment and Vehicles (including worker trips)	4.11	21.32	21.85	0.04	1.46	0.24
Phase 2: Deliver Catalyst and NH3 to initially fill tank	0.91	3.73	10.97	0.02	0.53	0.46
Total for 1 SCR Installation	**5**	**25**	**33**	**0**	**5**	**1**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Total for 2 SCR Installations (assumes 25% overlap)	**10**	**50**	**66**	**0**	**9**	**2**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Total for 5 SCR Installations (assumes 50% overlap)	**25**	**125**	**164**	**0**	**23**	**6**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Total for 7 SCR Installations (assumes 75% overlap)	**35**	**175**	**230**	**0**	**32**	**9**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Total for 9 SCR Installations (assumes 100% overlap)	**45**	**225**	**295**	**1**	**41**	**11**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**

Table 4-7
Overall [1] Net NOx Emission Reductions During Peak Daily "Worst-Case" Construction Activities with Operational Overlap (lbs/day)

Daily NOx Emission Reductions	Compliance Year 2011	2012	2013	2014	2015	2016
Group I Units via SCRs (8)	0	0	-322	-322	-322	-322
Group II Units (164) via Ultra-Low NOx burners	0	-771	-771	-1,028	-1,028	-1,028
Group II Units (9) via SCRs	0	0	0	-50	-50	-67
Group III Units (739) via Ultra-Low NOx burners	0	0	-442	-545	-692	-692
Low Usage Units (133)	0	0	0	0	-120	-120
Landfill Units (9)	0	0	0	0	-79	-79
Digester Gas Units (96)	0	0	0	0	-39 ~~-34~~	-39 ~~-34~~
Accumulated Total NOx Emission Reductions	**0**	**-771**	**-1,535**	**-1,945**	**-2,330** ~~**-2,342**~~	**-2,330** ~~**-2,342**~~
Daily NOx Increases during Construction of SCRs	0	296	230	0	66	0
Daily NOx Increases during Construction of Ultra-Low NOx Burners	8	8	7	7	0	0
Daily NOx Increases during Overlapping Operation of SCRs	0	24	46	46	46	70
Net Accumulated NOx Emission Reductions (Increase) after Construction	**(8)**	**-443**	**-1,252**	**-1,892**	**-2,218** ~~**-2,230**~~	**-2,260** ~~**-2,272**~~
NOX SIGNIFICANCE THRESHOLD (For Construction Activities)	100	100	100	100	100	100
SIGNIFICANT FOR NOX?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[1] Because NOx emission reductions are permanent, they accumulate each year until total NOx emissions are realized.

Because Group II units are eligible for a bifurcated compliance schedule, units undergoing burner replacement to comply with the standard compliance option (approximately 164 units) will have 75 percent of the units undergoing burner replacement during year 2011 and the remainder during year 2013. The second occurrence of peak construction emissions will be associated with the remaining nine Group II units because they are anticipated to undergo construction of SCR systems to comply with the enhanced compliance option. In this case, PAR 1146 would require that at least 75 percent or seven units would be constructed in year 2013 and the remaining two units would be constructed during year 2015.

For each year of construction, there will be a net NOx emission reduction benefit regardless of the fact that NOx construction emissions are estimated to exceed the construction significance threshold for NOx. The overall NOx emission reduction benefits are summarized in Table 4-7. Based on the NOx emission reductions anticipated for the proposed project, the overall net air quality effects for NOx emissions during each year of construction activities for the proposed project will not exceed the NOx air quality significance threshold for construction. No other pollutants exceed the air quality significance thresholds.

PROJECT-SPECIFIC MITIGATION: Except for NOx emissions, no other pollutant emissions exceed the applicable significance thresholds during construction. However, the analysis indicates that there will be an overall reduction in NOx emissions during both construction and when the construction and operational phases overlap. Thus, there are no significant adverse air quality impacts with the construction phase of the proposed project and as such, no mitigation measures are required.

Operational Emissions

PROJECT-SPECIFIC IMPACTS: The objective of the proposed project is to reduce NOx emissions from combustion equipment. The benefits of full implementation of PAR 1146 (i.e., after construction activities are completed) are the decrease of NOx emissions by approximately 1.17 tons per day by the year 2016. Implementation is expected to be achieved by installing ultra-low NOx burners and SCRs on boilers, steam generators and process heaters.

While the operational-related activities are simultaneously expected to reduce NOx emissions, , the operation-related activities are expected to generate emissions from specific mobile sources and stationary source equipment. As no additional employees are anticipated to be needed to operate the new SCRs, the existing work force per affected facility is expected to be sufficient. As such, no workers' travel emissions are anticipated for the operation of the new SCRs. However, there will be haul truck emissions associated with hauling away spent catalyst modules and delivering fresh catalyst modules over a staggered five-year period and delivering aqueous ammonia to refill the storage tanks on a monthly basis.

The offsite truck deliveries principally consist of exhaust emissions (NOx, SOx, CO, VOC, PM10, and PM2.5) from the operation of delivery vehicles to and from each affected refinery. Based on the "worst-case" assumption that two facilities could replace spent catalyst with fresh catalyst on the same day and that four ammonia tanks (two from Group I and two from Group II) would need refilling on the same day during any month, the increase in delivery frequency will be approximately four one-way truck trips every five years for catalyst deliveries and four one-way truck-trips per day for refilling the ammonia tanks.

Table 4-8 summarizes the increase in peak operational emissions due to the anticipated increase in truck deliveries as a result of implementing PAR 1146. Though a portion of the operational emissions are assumed to occur as early as 2012, peak operational emissions are expected to occur in the year 2016 because that would be the earliest possible year when catalyst modules would need replacing for the Group I SCR units. The total daily operational emissions do not exceed the SCAQMD's CEQA air quality operation emissions significance thresholds of 550 pounds per day of CO, 55 pounds per day of VOC, 150 pounds per day of SOx, 150 pounds per day of PM10, and 55 pounds per day of PM2.5, but do exceed air quality operation emissions significance threshold of 55 pounds per day of NOx. Therefore, with the exception of NOx, based on the results in Table 4-7, air quality impacts from operational emissions are considered to be less than significant. However, as previously discussed, the potentially significant increase in NOx emissions during operations is expected to be offset by the overall reduction of 1.17 tons per day of NOx emissions for the entire proposed project as a result of implementing PAR 1146. Appendix B contains the spreadsheets for the proposed project with the results based on the assumptions used by the SCAQMD staff for this analysis.

Based on the fact that the proposed project overall is expected to generate a net reduction in NOx emissions during operation, no significant adverse air quality impacts are expected as a result of implementing the proposed project. As shown in Table 4-7 for each implementation year, a net NOx emission reduction benefit would also be expected even if peak operational NOx impacts overlapped with peak construction impacts. The overall NOx emission reduction benefits are summarized in Table 4-7 and are as follows: 443 pounds per day (0.22 ton per day) for year 2012; 1,252 pounds per day (0.63 ton per day) for year 2013; 1,892 pounds per day (0.95 ton per day) for year 2014; 2,230 pounds per day (1.12 tons per day) for year 2015; and 2,272 pounds per day (1.14 tons per day) for year 2016. The proposed project will also result in a less than significant increase of SOx, CO, VOC, PM10, and PM2.5 operational emissions produced because of the additional truck deliveries necessary to accommodate the catalyst and ammonia demand.

Emission sources associated with the operational-related activities as a result of implementing PAR 1146 may emit toxic air contaminants. Only one facility, Facility C as listed in Table 3-2, has four units that may be retrofitted with four SCR units and four ammonia storage tanks on the same site. Further, Facility C is 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. Based on a five ppm ammonia slip from each of the four SCR units, the health risk assessment for this facility resulted in a chronic hazard index of 0.0095 and an acute hazard index of 1.4×10^{-6} for Facility C at the nearest sensitive receptor. Since both hazard indices are less than one (the significance threshold for TACs), no significant air quality impacts with respect to toxics are expected from the proposed project. Ammonia is not classified as a carcinogen, so a cancer risk analysis was not performed.

All other affected Group I facilities would only need one SCR unit onsite to comply with PAR 1146. Given the extremely low chronic and acute hazard indices resulting from four SCRs, it is unlikely that facilities with a single SCR would exceed either the chronic or acute hazard index at the nearest sensitive receptor. Further, no sensitive receptors are located within 1,000 feet of the facilities expected to install a single SCR. Therefore, no potential for significant adverse impacts from hazardous emissions on sensitive receptors is expected from the proposed project (see also "Hazards and Hazardous Materials" section).

Table 4-8
Summary of Peak Daily "Worst-Case" Operational Emissions

Operational Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Offsite Truck Delivery of Fresh Catalyst & Removal of Spent Catalyst for Two Group I SCRs	2.04	8.16	24.72	0.04	1.20	1.04
Offsite Truck Delivery of Fresh Catalyst & Removal of Spent Catalyst for Two Group II SCRs	1.80	7.44	21.96	0.04	1.08	0.92
Offsite Truck Delivery of Ammonia for2 Group I tanks	1.02	4.08	12.36	0.02	0.60	0.52
Offsite Truck Delivery of Ammonia for2 Group I tanks	0.90	3.72	10.98	0.02	0.54	0.46
Total Onsite and Offsite Operations	**6**	**23**	**70**	**0**	**3**	**3**
SIGNIFICANCE THRESHOLD	550	55	55	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**

As indicated in the analyses of construction and operational air quality impacts, the net effect overall during both phases is a reduction in NOx emissions. Further, even though the PAR 1146 will cause a temporary increase in emissions during construction, the temporary net increase in emissions combined with the total NOx emission reductions projected overall would not exceed any of the applicable significance thresholds in Table 4-2.

ODOR IMPACTS

Under normal operating and permitted conditions for SCR units, ammonia slip will be limited to five ppm. Because exhaust gases are hot, any ammonia slip emissions 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 and 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. Based on the Tier II health risk analysis the highest concentration at Facility C, the facility with the greatest ammonia slip, would be 3.85×10^{-6} ppm which is well below the odor threshold of ammonia.

In addition, there will be odors associated with the operation of diesel-fueled construction equipment used to install the SCR units. However, because of the relatively small number of pieces of diesel-fueled equipment operating at any one affected site and the short duration of construction, odor impacts are not expected to be significant.

PROJECT-SPECIFIC MITIGATION: Except for NOx emissions, no other pollutant emissions exceed the applicable significance thresholds during construction. However, the analysis indicates that there will be an overall reduction in NOx emissions during the operational phase of the project and the same remains true when the construction and operational phases overlap. Thus, there are no adverse significant air quality impacts with the operational phase of the proposed project and as such, no mitigation measures are required.

REMAINING AIR QUALITY IMPACTS: 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 significance threshold of 100 pounds per day of NOx. However, the analysis further indicates that there will be an overall reduction in NOx emissions during both construction and operational phases of the proposed project. No other pollutants exceed the SCAQMD's significance thresholds for construction or operation. Therefore, it is concluded that PAR 1146 does not have the potential to generate significant adverse air quality impacts.

CUMULATIVE AIR QUALITY IMPACTS: Because the project specific air quality impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative air quality impacts. Further, cumulative air quality impacts from the proposed project and all other AQMP control measures, when considered together, are not expected to be significant because implementation of all AQMP control measures is expected to result in net emission reductions and overall air quality improvement.

CUMULATIVE MITIGATION MEASURES: None required.

GLOBAL WARMING IMPACTS

As indicated in Chapter 3, combustion processes generate greenhouse gas (GHG) emissions in addition to criteria pollutants. The following analysis focuses on directly emitted CO2 because this is the primary GHG pollutant emitted during the combustion process and is the GHG pollutant for which emission factors are most readily available. CO2 emissions were estimated using emission factors from CARB's EMFAC2007 and Offroad2007 models and EPA's AP-42.

The analysis of GHGs is a much 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 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. GHG emissions are typically considered to be cumulative impacts because they contribute to global climate effects. GHG emission impacts from implementing PAR 1146 were calculated at the project-specific level. For example, installation of ultra-low NOx burners and SCR units to reduce NOx emissions has the potential to increase the fuel use through the unit by two percent and five percent, respectively, which will in turn increase CO2 emissions.

For the purposes of addressing the GHG impacts of PAR 1146, the overall impacts of CO2 emissions from the project were estimated and evaluated from initial implementation of the proposed project in 2011 through 2016. While the analysis was only completed through 2016, it is expected that the NOx emission reductions would continue beyond 2016 through the end of the useful life of the equipment. The analysis estimated CO2 emissions from all sources subject to PAR 1146 (construction and operation) from the beginning of the proposed project (2011) to the end of the project (2016). The beginning of the proposed project would be 2011, since it was assumed that emission reductions would begin by installing ultra-low NOx burners, while the end of the proposed project would be 2016 since the last of the SCR units would be constructed and operational by the final compliance date and no further changes in CO2 emissions are anticipated. With the use of ultra-low NOx burners and SCR, PAR 1146 will have an increase in CO2 emissions over the first six years of implementation. Without employing these NOx emission controls as part of the proposed project, there would be no change to the CO2 baseline over the same time frame. Table 4-9 summarizes the CO2 impacts from both construction activities and operation activities, when they overlap.

With the exception of the San Joaquin Valley Air Pollution Control District (SJVAPCD), neither SCAQMD nor other regulatory air agencies in California have established a significance threshold for GHG emissions yet. In the absence of a specific significance threshold, SCAQMD staff has evaluated significance for projects where it is the lead agency on a case-by-case basis. In this analysis, SCAQMD staff has used a variety of benchmarks to evaluate GHG impacts. As additional information is compiled with regard to the level of GHG emissions that constitute a significant adverse cumulative climate change impact, SCAQMD will continue to revisit and possibly revise the level of GHG emissions considered to be significant.

In its *CEQA & Climate Change* document (January, 2008), CAPCOA identifies many potential GHG significance threshold options. The CAPCOA document indicates that establishing quantitative thresholds is a balance between setting the level low enough to capture a substantial portion of future residential and non-residential development, while also setting a threshold high enough to exclude small development projects that will contribute a relatively small fraction of the cumulative statewide GHG emissions. For example, CAPCOA identifies one potential significance threshold as 10,000 metric tons per year, which was considered by the Market Advisory Committee for inclusion in a Greenhouse Gas Cap and Trade System in California. Another potential threshold identified by CAPCOA is 25,000 metric tons per year, which is CARB's proposed mandatory reporting threshold under AB 32. The significance threshold used by the SJVAPCD is 38,000 metric tons per year. GHG emissions increases from implementing PAR 1146 would be substantially lower than any of these thresholds.

Finally, another approach to determining significance is to estimate what percentage of the total inventory of GHG emissions are represented by emissions from a single project. If emissions are a relatively small percentage of the total inventory, it is possible that the project will have little or no effect on global climate change. According to available information, the statewide inventory of CO2 equivalent (CO2eq.) emissions is as follows: 1990 GHG emissions equal 427 million metric tons of CO2eq. and 2020 GHG emissions equal 600 million metric tons of CO2eq. with "business as usual" operations.

Table 4-9
Overall CO2 Increases Due to Construction Activities with Operational Overlap (metric tons/year)[1]

Annual CO2 Emission Increases	Compliance Year 2011	2012	2013	2014	2015	2016
Construct 8 SCRs on Group I Units[2]	0	1,802	0	0	0	0
Install Ultra-Low NOx Burners on 164 Group II Units & 739 Group III Units	21	87	22	52	0	0
Construct 9 SCRs on Group II Units[2]	0	0	1,577	0	450	0
Install Ultra-Low NOx Burners on 9 Landfill Units and 9 ~~6~~ Digester Gas Units	0	0	0	0	0	0
CO2 Increases Due to Construction	**21**	**1,889**	**1,599**	**52**	**450**	**0**
Operational Overlap – Ammonia Deliveries	0	37	78	78	78	78
Operational Overlap – Catalyst Change-out/Replacement	0	0	0	0	0	6
5% Fuel Penalty for SCRs	0	0.0103	0.0124	0.0124	0.0124	0.0124
2% Fuel Penalty for Ultra-Low NOx Burners	0.0117	0.0198	0.0237	0.0334	0.0334	0.0334
CO2 Increases Due to Operation	**0.0117**	**37.03**	**78.04**	**78.05**	**78.05**	**84.05**
TOTAL CO2 INCREASES	**21.01**	**1,926.03**	**1,677.04**	**130.05**	**528.05**	**84.05**

[1] 1 metric ton = 2,205 pounds

[2] Based on 130 days of construction per year.

Interpolating an inventory for the year 2012 (the year with the highest amount CO2 emissions from PAR 1146) results in approximately 554 million metric tons of CO2eq. The CO2 emission increase in 2012 from PAR 1146 represents 0.0003477 percent of the statewide GHG inventory estimated for 2012. This small percentage of GHG emissions compared to the total projected statewide GHG emissions inventory is another basis for the SCAQMD's conclusion that GHG emissions from implementing PAR 1146 are less than significant.

PAR 1146 is part of a comprehensive ongoing regulatory program that includes implementing related SCAQMD 2007 AQMP control measures as amended or new rules to attain and maintain with a margin of safety all state and national ambient air quality standards for all areas within its jurisdiction. The 2007 AQMP estimates a CO2 reduction of 427,849 metric tons per year by 2014, and a CO2 reduction of 1,523,445 metric tons per year by 2020. Therefore, PAR 1146 in connection with other 2007 AQMP control measures is not considered to be cumulatively significant.

Since GHG emissions are considered cumulative impacts, and the GHG emission increases from PAR 1146 are below the 10,000 metric tons per year Market Advisory Committee threshold, 25,000 metric tons per year CARB proposed mandatory reporting threshold under AB 32, SJVAPCD's 38,000 metric tons per year threshold, a small percentage of the total statewide GHG inventory in 2012, and, with other control measures in the 2007 AQMP, which is a comprehensive ongoing regulatory program that would reduce overall CO2 emissions; cumulative GHG adverse impacts from PAR 1146 are not considered significant.

HAZARDS AND HAZARDOUS MATERIALS IMPACTS

The hazards and hazardous materials analysis for the proposed project focuses on the transport, storage, and handling of aqueous ammonia used in the SCR 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 material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As such, SCAQMD staff does not issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by volume for use in SCR systems. As a result, this analysis focuses on the use of 19 percent by volume aqueous ammonia. The only exception to this assumption is the scenario analyzed under the "Ammonia Gas Release" subsection.

Only one of the affected facilities (Facility C) is 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 subsections.

The analysis of hazard impacts can rely on information from past similar projects (i.e., installing new, or retrofitting existing equipment with SCR 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 EA, 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.

Hazards and Hazardous Materials 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 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 Occupational Safety and Health Administration (OSHA) regulations (29 Code of Federal Regulations (CFR) Part 1910) that require the preparation of a fire prevention plan, and 20 CFR Part 1910 and CCR Title 8 that require prevention programs to protect workers who handle toxic, flammable, reactive, or explosive materials. In addition, §112 (r) of the 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 Risk Management Programs (RMPs) to prevent accidental releases of these substances. If any of the affected facilities has already prepared an RMP, it may need to be revised to incorporate the changes associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

It is expected that the operators of affected facilities will 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. Therefore, 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 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. Based on the onsite storage capacity and consumption of ammonia for past projects analyzed by the SCAQMD and the projections for future ammonia use and storage as calculated relative to the quantity of NOx emission reductions for PAR 1146 as shown in Appendix B, the "worst-case" assumption for delivery frequency from a supplier would be to deliver 500 gallons of ammonia to four facilities to fill four new ammonia tanks on the same day. Because the "worst-case" for PAR 1146 involves much less ammonia on any given day than what is analyzed in the following Transportation Release 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 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 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 4-10. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

In the study completed by 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 4-10
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.
* 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. The major route for aqueous ammonia to reach most of the affected refineries is primarily from the 405 freeway to Alameda Boulevard to Sepulveda Boulevard, which would generally avoid sensitive receptors. 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 was retrofitted onto an existing FCCU and an associated 12,660 gallon ammonia storage tank was constructed (Final Negative Declaration for: BP Carson Refinery Fluid Catalytic Cracking Unit NOx Reduction Project: SCH No. 2002021068; SCAQMD, 2002). The following summarizes the ammonia transport analysis for the BP 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 °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 PAR 1145 would be 500 gallons. Most of the affected facilities were estimated to need one 500-gallon tank. However, there is one facility, Facility C, that has four units located in one building that would need to share one 1,500-gallon aqueous ammonia tank[7]. Facility C is also located within ¼-mile of sensitive receptors.

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 ammonia storage tanks that would be installed in the future, to estimate a worst-case analysis, the following assumptions were made for Facility C:

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
Quantity Released: 1,650 gallons of aqueous ammonia will be spilled into a berm (the total of one 1,500-gallon tanks plus 10 percent to account for a rupture during filling)
Release duration: 10 minutes
Release Rate: 252 pounds per minute
Liquid Temperature at the time of the spill: 110 degrees Fahrenheit
Mitigation Measures: Release into an open berm, in direct contact with outside air
Topography: Urban surroundings with many obstacles in the immediate area
Toxic Endpoint: 0.14 milligrams per liter (basis: ERPG-2)
Wind Speed: 1.5 meters per second (3.4 miles per hour)
Air Temperature: 77 degrees Fahrenheit

The estimated distance to the toxic endpoint for Facility C is 0.2 miles or 1,056 feet. Since the sensitive receptors are located directly across from Facility C, if four SCR units with 1,500 gallons of aqueous ammonia storage capacity are installed at this location, the hazards and hazardous materials impacts due to tank rupture will be potentially significant. Therefore, PAR 1146 has the potential to generate significant adverse hazard impacts as a result of the potential for accidental releases of aqueous ammonia.

[7] Note that in the Air Quality section, the worst-case construction impacts were based on the assumption that 17 ammonia tanks would need to be built. However, for the hazards analysis, it is more conservative to analyze what the worst-case would be with regard to an aqueous ammonia spill. Since Facility C is estimated to need three times the amount of aqueous ammonia to operate three SCR units, worst-case is based on the total volume of three-tanks, or 1,500 gallons of aqueous ammonia.

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 one of the affected facilities (Facility C) is located within ¼-mile of a sensitive receptor, implementation of PAR 1146 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 PAR 1146 are significant.

PROJECT-SPECIFIC MITIGATION MEASURES: The following mitigation measures are recommended.

1. 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.
2. 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.
3. Conduct integrity testing of aqueous ammonia storage tanks to assist in preventing failure from structural problems.
4. 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 material impacts from aqueous ammonia, they are not expected to reduce impacts to less than significant. Therefore, the remaining hazardous and hazardous material 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.

CUMULATIVE IMPACT: 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 sensitive receptors are closer than 0.2 mile, 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). None of the affected facilities under PAR 1146 are located within one mile of each other. The worst-case aqueous ammonia toxic endpoint is less than or equal to 0.2 mile. Since none of the facilities that would install SCR are within one mile of each other, no receptors would be affected by accidents at multiple facilities. 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 PAR 1146 are considered to be significant.

CUMULATIVE IMPACT MITIGATION: No additional mitigation measures were identified that reduce cumulative impacts from hazards and hazardous materials, to less than significant. Therefore, cumulative hazards/hazardous materials impacts remain significant.

POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

While all the environmental topics required to be analyzed under CEQA were reviewed to determine if PAR 1146 would create significant impacts, the screening analysis concluded that the following environmental areas would not be significantly adversely affected by the proposed project: aesthetics, agriculture resources, biological resources, cultural resources, energy, geology/soils, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, solid/hazardous waste and transportation/traffic. No comments were received on the NOP/IS that disputed these conclusions. These topics were not analyzed in further detail in this environmental assessment, however, a brief discussion of each is provided below.

Aesthetics

Implementation of PAR 1146 is expected to involve construction activities related to the modification of existing equipment by installing either ultra-low NOx burners or SCR systems at industrial, commercial, and institutional facilities. However, the construction activities are not expected to adversely impact views and aesthetics resources since most of the heavy equipment and activities are expected to occur within each facility and are expected to introduce only minor visual changes to areas outside each facility, if at all, depending on the location of the construction activities within the facility. The majority of the construction equipment is expected to be low in height and not substantially visible to the surrounding area due to existing fencing along the property lines and existing structures currently within the facilities that would buffer the views of the construction activities. Further, the construction activities are expected to be temporary in nature and will cease following completion of the equipment installation or modifications.

Depending on the type of NOx emissions control employed (i.e., ultra-low NOx burners or SCR), the proposed project could potentially introduce minor visual changes at some facilities. The affected units, depending upon their locations within each facility, could potentially be visible to areas outside of each facility. However, the affected units are expected to be about the same size profile as existing equipment present at each affected facility. The general appearance of the affected units is not expected to differ significantly from other equipment units such that no significant impacts to aesthetics are expected. Further, no scenic highways or corridors are located in the vicinities of the affected facilities such that the proposed project would not obstruct scenic resources or degrade the existing visual character of a site, including but not limited to, trees, rock outcroppings, or historic buildings.

There are no components in PAR 1146 that would require construction activities to occur at night. Therefore, no additional lighting at the affected facilities would be required as a result of complying with PAR 1146. Similarly, the existing equipment subject to PAR 1146 are located in existing structures or areas that already have lighting systems in place. Further, PAR 1146 equipment are designed to be used up to 24 hours per day, so the equipment are not restricted to operate during a specific time of day. Thus, PAR 1146 contains no provisions that would require affected equipment to operate differently during existing daytime or nighttime operations. Therefore, PAR 1146 is not expected to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, the proposed project is not expected to create significant adverse aesthetic impacts.

Agriculture Resources

All construction and operational activities that would occur as a result of implementing PAR 1146 are expected to occur within the confines of the existing affected facilities. The proposed project would be consistent with the commercial, industrial and institutional zoning requirements for the various facilities and there are no agricultural resources or operations on or near the affected facilities. No agricultural resources including Williamson Act contracts are located within or would be impacted by construction activities at the affected facilities. Therefore, the proposed project would not result in any new construction of buildings or other structures that would convert farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract. Since PAR 1146 would not substantially change the facility or process for which the affected units are utilized, there are no provisions in PAR 1146 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agricultural resources will be altered by the proposed project. Therefore, the proposed project is not expected to create significant adverse agriculture resource impacts.

Biological Resources

PAR 1146 would only affect units operating at existing facilities located throughout the district. The physical changes involved that may occur focus on the installation of control equipment such as ultra-low NOx burners and SCR units to reduce NOx emissions from boilers, steam generators and process heaters. All of the affected units operating at existing facilities are located in industrial, commercial and institutional areas, which have already been greatly disturbed. In general, these areas currently do not support riparian habitat, federally protected wetlands, or migratory corridors. Additionally, special status plants, animals, or natural communities are not expected to be found within close proximity to the affected facilities. Therefore, the proposed project would have no direct or indirect impacts that could adversely affect plant or animal species or the habitats on which they rely in the SCAQMD's jurisdiction. The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions. A conclusion in the Program Environmental Impact Report (EIR) for the 2007 AQMP was that population growth in the region would have greater adverse effects on plant species and wildlife dispersal or migration corridors in the basin than SCAQMD regulatory activities, (e.g., air quality control measures or regulations). The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions.

Further, the proposed project is not envisioned to conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Additionally, the proposed project will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan, and would not create divisions in any existing communities because all activities associated with complying with PAR 1146 will occur at existing industrial, commercial and institutional facilities. Therefore, the proposed project is not expected to create significant adverse biological resource impacts.

Cultural Resources

There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Since construction-related activities associated with the implementation of

PAR 1146 are expected to be confined within the existing footprint of the affected facilities, no impacts to historical resources are expected to occur as a result of implementing the proposed project.

Installing add-on controls and other associated equipment to comply with PAR 1146 will require disturbance of previously disturbed areas, i.e., existing industrial or commercial facilities. However, since construction-related activities are expected to be confined within the existing footprint of the affected facilities, PAR 1146 is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that these areas are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed. Therefore, PAR 1146 has no potential to cause a substantial adverse change to a historical or archaeological resource, directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or disturb any human remains, including those interred outside a formal cemeteries. The proposed project is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the district. PAR 1146 is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the district.

Energy

PAR 1146 would reduce emissions of NOx from various existing combustion sources at affected facilities. The expected options for compliance are either replacing burners with ultra-low NOx burners or installing SCRs. Further, it is expected that the installation and operation of any equipment used to comply with PAR 1146 will also comply with all applicable existing energy standards.

PAR 1146 is not subject to any existing energy conservation plans. If a facility that is subject to PAR 1146 is also subject to energy conservation plans, it is not expected that PAR 1146 will affect in any way or interfere with that facility's ability to comply with its energy conservation plan or energy standards. Further, project construction and operation activities will not utilize non-renewable resources in a wasteful or inefficient manner.

Electricity could be utilized to operate certain construction equipment. This demand can likely be met with the existing electrical capacity at each of the affected facilities. Installation of SCR equipment to comply with PAR 1146 increases demand for energy used for operating pumps, fans, controllers, etc. Specifically, increased energy demand from the SCR and associated equipment at full load is approximately 0.7 percent, according to a 1988 SCR demonstration project performed by Southern California Edison. At low loads, demands increased by up to seven percent, but vendors contacted by SCAQMD staff at the time indicated that the 0.7 percent increase in energy demand was more accurate. Any additional electricity required is typically supplied by each affected facility's local electrical utility, unless the facility operates its own cogeneration unit, so it is not anticipated that new or substantially altered power utility systems will need to be built to accommodate any additional electricity demands created by the proposed project. No increase in natural gas use is expected for operations subject to the proposed project. Use of ultra-low NOx burners is expected to be a more efficient combustion option than continued use of existing burners, which could potentially reduce demand for natural gas at affected facilities.

Additional energy information as it relates to the fuel usage for construction and operational activities was derived as part of the air quality analysis in this chapter and the calculations are shown in Appendix B of this Final ~~draft~~ EA. Table 4-11 presents a summary of the total projected fuel usage for both construction and operational activities. The results confirm the conclusion that the energy impacts from the proposed project are not expected to be significant.

Table 4-11
Total Projected Fuel Usage

Activity	Total Fuel Usage per Activity (gallons/day)	
	Diesel	**Gasoline**
Construction Equipment and Workers Vehicles to Install 8 SCRs on Group I units in 2012	1,055	408
Construction Equipment and Workers Vehicles to Install 7 SCRs on Group II units in 2013	923	357
Construction Equipment and Workers Vehicles to Install 2 SCRs on Group II units in 2015	264	102
Construction Equipment and Workers Vehicles to Install Ultra-Low NOx Burners	24	75
Aqueous Ammonia Deliveries	82	0
Fresh Catalyst Deliveries	82	0
Spent Catalyst Removal	82	0
Total Usage	2,512	942
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.00023%	0.000015%
Significant (Yes/No)[b]	No	No

[a] Year 2000 California Energy Commission (CEC) projections. Construction activities in future years would yield similar results.
[b] SCAQMD's energy threshold for both diesel and gasoline is 1% or more of supply.

Geology and Soils

Since the proposed project would result in construction activities in industrial, commercial, or institutional settings to install control equipment, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. Southern California is an area of known seismic activity. Since the proposed project would result in construction activities in industrial or commercial settings to install control equipment, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. Accordingly, the installation of add-on controls at existing affected facilities to comply with the proposed project is expected to conform with the Uniform Building Code and all other applicable state and local building codes. As part of the issuance of building permits, local jurisdictions are responsible for assuring that the Uniform Building Code is adhered to and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation condition at the site. The Uniform Building Code

requirements also consider liquefaction potential and establish stringent requirements for building foundations in areas potentially subject to liquefaction. Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death is not anticipated.

Since installing SCR units with ammonia storage tanks could potentially be installed to retrofit existing boilers, steam generators and process heaters at affected facilities which may require the need to build an ammonia containment berm, construction of the proposed project may cause temporary erosion resulting from excavating and grading activities. However, these activities are expected to be minor since the existing facilities are generally flat and have previously been graded. Appendix B contains the air quality analysis that demonstrates the estimated fugitive PM10 emissions are less than significant from activities such as grading, trenching, stockpile loading, wind erosion, and truck filling and dumping in order to build an ammonia containment berm. Further, this analysis confirms that wind erosion is not expected to occur to any appreciable extent, because operators at dust generating sites would be required to comply with the best available control measure (BACM) requirements of SCAQMD Rule 403 – Fugitive Dust. In general, operators must control fugitive dust through a number of soil stabilizing measures such as watering the site, using chemical soil stabilizers, revegetating inactive sites, etc. As the proposed project may involve the installation of add-on control equipment for combustion sources at existing facilities, some grading or excavation could be required to provide stable foundation footings. Potential air quality impacts related to grading are addressed elsewhere in this Air Quality section of this Final ~~Draft~~ EA. No unstable earth conditions or changes in geologic substructures are expected to result from the proposed project.

Since the proposed project will affect existing facilities, it is expected that the soil types present at the affected facilities will not be further susceptible to expansion or liquefaction. Furthermore, subsidence is not anticipated to be a problem since little excavation, grading, or filling activities is expected occur at affected facilities. Additionally, the affected areas are not envisioned to be prone to landslides or have unique geologic features since the affected facilities are existing facilities that are typically located in industrial, commercial and institutional areas.

In addition, since the proposed project will affect existing facilities located in industrial, commercial or institutional zones, it is expected that people or property will not be exposed to expansive soils or soils incapable of supporting water disposal. Further, typically each affected facility has some degree of existing wastewater treatment systems that will continue to be used and are expected to be unaffected by the proposed project. Sewer systems are available to handle wastewater produced and treated by each affected facility. Each existing facility affected by the proposed project does not require installation of septic tanks or alternative wastewater disposal systems. As a result, the proposed project will not require operators to utilize septic systems or alternative wastewater disposal systems. Thus, the proposed project will not adversely affect soils associated with a septic system or alternative wastewater disposal system.
Based upon the aforementioned considerations, significant geology and soils impacts are not expected from the implementation of the proposed project.

Hydrology and Water Quality
Facilities affected by the proposed project are expected to install new or modify their existing air pollution control equipment, such as SCR and ultra-low NOx burners. However, no additional water demand or wastewater generation is expected to result from the operation of SCR systems

or ultra-low NOx burners at stationary sources because these control technologies do not entail the use of water in the NOx control process. Construction activities associated with the proposed project may require the use of water as a dust suppressant if grading is required. However, the installation of these types of air pollution control equipment at existing facilities is not expected to require additional grading. Other than possible grading for installing ammonia storage tanks as part of the installation of SCR units, most of the modifications would occur to existing equipment (i.e., adding burners and flue gas ductwork). Initial estimates show that approximately eight Group I units and nine Group II units may be retrofitted with SCR, which may also require ammonia storage tank installations. For a conservative "worst-case" analysis, if all eight Group I units are simultaneously retrofitted in compliance year 2012 and all nine Group II units are simultaneously retrofitted in compliance year 2013 and if all of these construction sites require grading of approximate 225 square feet or less on an existing site, one 6,000 gallon capacity water truck per day per site can be assumed as sufficient for dust control. Thus, the maximum amount of water which could potentially be used for dust control during construction would be 54,000 gallons per day. The proposed project does not increase demand for water by more than significance threshold of 5,000,000 gallons per day. Therefore, a minimal amount of water, if at all, is expected to be used for this purpose. Additionally, water used for dust suppression does not have to be of potable quality, but can be reclaimed water. Reclaimed water is currently available in many areas of the SCAQMD's jurisdiction. Thus, the impacts of the proposed project on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant.

The proposed project is not expected to significantly adversely affect the quantity or quality of groundwater in the area of each affected facility. No significant adverse impacts are expected to ground water quality from the proposed project because: 1) wastewater will continue to be collected and treated in each of the affected facility's wastewater treatment systems or in compliance with the current wastewater discharge permits, as applicable; 2) no underground storage tanks are expected to be constructed as part of the proposed project; 3) containment berms will be required or may already exist around the new or modified units to minimize the potential for an ammonia spill to contaminate soil and groundwater; and, 4) any new storage tanks that may be proposed will be required to comply with BACT and other safety requirements such as double bottom and monitoring requirements.

Changes to each affected facility's storm water collection systems are expected to be less than significant since most of the changes will occur within existing units (i.e., replacement of existing equipment with new equipment or installing control equipment on existing equipment). Further, typically most of the areas likely to be affected by the proposed project are currently paved and are expected to remain paved. Any new units constructed will be curbed and the existing units will remain curbed to contain any runoff. Any runoff occurring will continue to be handled by each affected facility's wastewater system and sent to an on-site wastewater treatment system prior to discharge. The surface water runoff is expected to be handled with each facility's current wastewater treatment system. Storm water runoff will be collected and discharged in accordance with each facility's discharge permit terms and conditions.

The proposed project is expected to involve construction activities located within the confines of existing facilities and does not include the construction of any new housing so it would not place new housing within a 100-year flood hazard area. It is likely that most affected facilities are not located within a 100-year flood hazard area. Any affected facilities that may be located in a 100-year flood area could impede or redirect 100-year flood flows, but this would be considered part of the existing setting and not an effect of the proposed project. The proposed project would not

require locating new facilities within a flood zone, so it is not expected to expose people or property to any known water-related flood hazards.
The proposed project does not require construction of new facilities in areas that could be affected by tsunamis. Of the facilities affected by the proposed project, none are located near the Ports of Long Beach, Los Angeles, and San Pedro. The port areas are protected from tsunamis by the construction of breakwaters. Construction of breakwaters combined with the distance of each facility from the water is expected to minimize the potential impacts of a tsunami or seiche so that no significant impacts are expected. The proposed project does not require construction of facilities in areas that are susceptible to mudflows (e.g., hillside or slope areas). Existing affected facilities that are currently located on hillsides or slope areas may be susceptible to mudflow, but this would be considered part of the existing setting. As a result, the proposed project is not expected to generate significant adverse mudflow impacts.

Each affected facility is expected to have sufficient water supplies available for the proposed project. Since the type of air pollution control equipment that would be installed at affected facilities does not use water as part of the control process, and limited water demand increases may occur for dust suppression during limited grading activities, the need for new or expanded water supply entitlements is not expected. Should any additional demand for clean water arise, the increase in water demand is expected to be within the available water supply for each affected facility as indicated by the MWD projections.

While it is not possible to predict water availability in the future, existing entitlements and resources in the district provide sufficient water supplies that currently exceed demand. According to the Metropolitan Water District (MWD), the largest supplier of water to California, MWD expects to be able to meet 100 percent of its member agencies' water needs for the next ten years, even during times of critical drought. MWD and its member agencies have identified and are implementing programs and projects to assure continued reliable water supplies for at least the next 20 years. MWD is expected to continue providing a reliable water supply through developing a portfolio of diversified water sources that includes: cooperative conservation; water recycling; and groundwater storage, recovery, and replenishment programs. Other additional water supplies will be supplied in the future as a result of water transfer from other water agencies, desalination projects and state and federal water initiatives, such as CALFED and California's Colorado River Water Use Plan. (Metropolitan Water District Annual Progress Report to the California's State Legislature, February 2002.)

Based on the aforementioned considerations, the potential hydrology and water quality impacts, especially those associated with wastewater discharge, storm water discharge, and water demand are expected to be less than significant.

Land Use and Planning
The proposed project does not require construction of new facilities, but any physical effects will occur at existing facilities and, thus, it will not result in physically dividing any established communities. There are no provisions in the proposed project that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Further, the proposed project would be consistent with the typical industrial, commercial, and institutional zoning of the affected facilities. All proposed modifications are expected to occur within the confines of the existing facilities. The proposed project would not affect in any way habitat conservation or natural community conservation plans, agricultural resources or

operations, and would not create divisions in any existing communities. Further, no new development or alterations to existing land designations will occur as a result of the implementation of the proposed project. Therefore, present or planned land uses in the region will not be affected as a result of the proposed project. Based upon these considerations, significant land use planning impacts are not expected from the implementation of the proposed project.

Mineral Resources

There are no provisions of the proposed project that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state such as aggregate, coal, clay, shale, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Noise

Modifications or changes associated with the implementation of the proposed project will take place at existing facilities that are located in industrial, commercial and institutional settings. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. Construction activities for the proposed project may generate some noise associated with the use of construction equipment and construction-related traffic in the event that grading for the installation of new ammonia tanks, for example, is necessary. However, noise from the proposed project is not expected to produce noise in excess of current operations at each of the existing facilities. If SCR is installed, the operations phase of the proposed project may add new sources of noise to each affected facility. However, it is expected that each facility affected will comply with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. These potential noise increases are expected to be small, if at all, and thus less than significant.

Though some of the facilities affected by PAR 1146 are located at sites within an airport land use plan, or within two miles of a public airport, the addition of SCR control equipment would not expose people residing or working in the project area to the same degree of excessive noise levels associated with airplanes. All noise producing equipment must comply with local noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. Based upon the aforementioned considerations, significant noise impacts are not expected from the implementation of the proposed project.

Population and Housing

Minor construction activities associated with the proposed project at each affected facility are not expected to involve the relocation of individuals, require new housing or commercial facilities, or change the distribution of the population. The reason for this conclusion is that operators of affected facilities who need to perform any construction activities to comply with the proposed project can draw from the existing labor pool in the local southern California area. For example, the analysis of air quality impacts for the proposed project assumed 20 construction workers would be necessary to a Group I or Group II unit with SCR. The "worst-case" analysis further assumed that up to eight units could be under construction during any six-month construction period. This translates to the need of 160 construction workers during any six-month construction period. Construction crews comprising of 160 individuals can easily be drawn from the local labor force. Further, it is not expected that replacing existing equipment with new

equipment or installing air pollution control equipment will require new employees during operation of the equipment. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing the proposed project. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth in the district or population distribution.

Because the proposed project includes modifications and/or changes at existing facilities located in industrial, commercial and institutional settings, the proposed project is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the district. Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project.

Public Services

Implementation of the proposed project by installing ultra-low NOx burners or SCR units is anticipated to continue current operations at existing affected facilities. The proposed project may result in greater demand for aqueous ammonia, which will need to be transported to the affected facilities that install SCR and stored onsite prior to use. In the event of an accidental release, fire departments are typically first responders for control and clean-up and police may need to be available to maintain perimeter boundaries. The proposed project is not expected to have a significantly adverse affect on fire or police departments because of the low probability of accidents during transport as explained below.

The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, driver training, and weather. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality and some accidents result in little or no property damage or personal injury. Additionally, not every truck accident results in an explosion or a release of hazardous substances.

Every time hazardous materials are moved from the site of generation, there is the potential for accidental 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 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 rates previously presented in Table 4-8 of the hazards analysis in this Final ~~Draft~~ EA (Los Angeles County, 1988).

Based on the low probability of accidents occurring, as shown in Table 4-10, the proposed project is not expected to increase the need or demand for additional public services (e.g., fire departments, police departments, schools, parks, government, et cetera) above current levels.

As noted in the previous "Population and Housing" discussion, the proposed project is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at affected facilities and operation of new or modified equipment is not expected to require

additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

The proposed project is expected to result in the use of ultra-low NOx burners and SCR units. Besides permitting the equipment or altering permit conditions by the SCAQMD, there is no need for other types of government services. The proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population and, therefore, no need for physically altered government facilities. Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed project.

Recreation

As discussed previously under "Land Use," there are no provisions to the proposed project that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments; no land use or planning requirements are expected to be altered by the proposed project. Further, the proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities or include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment because the proposed project is not expected to induce population growth. Based upon these considerations, significant recreation impacts are not expected from the implementation of the proposed project.

Solid/Hazardous Waste

The proposed project is expected to slightly increase the quantity of waste generated at the affected facilities that replace existing burners with ultra-low NOx burners and install new SCR units. The waste is associated with solid materials from construction activities associated with any air pollution control equipment or other related components being replaced, as applicable, and spent catalysts generated from SCR units, et cetera, and may result in an incremental increase in the total waste generated by each affected facility.

Solid or hazardous wastes generated from construction-related activities would consist primarily of materials from the removal of old burners and construction associated with new air pollution control equipment. Construction-related waste would likely be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 48 Class II/Class III landfills within the SCAQMD's jurisdiction. Based on a search of the California Integrated Waste Management Board's Solid Waste Information System (SWIS) on May 16, 2007, the landfills that accept construction waste in Los Angeles, Orange, Riverside and San Bernardino counties have a combined remaining disposal capacity of approximately 750,846,000 cubic yards (1,250,367,507 tons).

However, it is expected that some affected facilities will address the increase in waste through existing waste minimization plans. In addition, other affected facilities that have existing catalyst-based operations currently regenerate, reclaim or recycle the catalysts, in lieu of disposal. Moreover, due to the heavy metal content and its relatively high cost, catalyst recycling can be a lucrative choice.

Although it is expected that spent catalysts would be reclaimed and recycled, it is possible that spent catalysts could be disposed of. The composition of the catalyst will determine in which

type of landfill a catalyst would be disposed. There are two main types of catalysts: one in which the catalyst is coated onto a metal structure and a ceramic-based catalyst onto which the catalyst components are calcified.
Catalysts with a metal structure would not normally be considered a hazardous waste. Instead, it would be considered a metal waste, like copper pipes, and, therefore, would not be a regulated waste requiring disposal in a Class I landfill unless it is friable or brittle. Ceramic-based catalysts are not considered friable or brittle because they typically include a fiber binding material in the catalyst material. In both cases, spent catalyst would not require disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill.

Based on the aforementioned information, it is likely that spent catalysts would be considered a "designated waste," which is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state (CCR, Title 23, Chapter 3 Subparagraph 2522(a)(1)). Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. According to the Program EIR for the 2007 AQMP (SCAQMD, 2007), total Class III landfill waste disposal capacity in the district is approximately 93,979 tons per day, many of which have liners and can handle Class II and Class III wastes.

Disposal of spent catalyst would typically involve crushing the material and encasing it in concrete prior to disposal. Since it is expected that most spent catalysts will be recycled and regenerated, it is anticipated that there will be sufficient landfill capacity in the district to accommodate disposal of any spent catalyst materials. Thus, the potential increase of solid waste generated by the air pollution control equipment may not necessarily be disposed of and, therefore, is not expected to exceed the capacity of designated landfills available to each affected facility. Further, implementing the proposed project is not expected to hinder in any way any affected facility's ability to comply with existing federal, state, and local regulations related to solid and hazardous wastes. Based upon these considerations, significant solid/hazardous waste impacts are not expected from the implementation of the proposed project.

Transportation/Traffic
Construction activities resulting from implementing the proposed project may generate a slight, albeit temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, the proposed project is not expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected refineries. Also, the proposed project is not expected to exceed, either individually or cumulatively, the current level of service of the areas surrounding the affected facilities during construction as explained in the following paragraph.

As previously noted in the section that discusses "Population and Housing," the maximum construction workforce during any six-month construction period is expected to be approximately 160 workers. Even if it is assumed that all 160 construction workers drive alone (which represents an average vehicle ridership equal to 1.0) not all of the workers would be driving to the same facility. It is unlikely that these vehicle trips would substantially affect the level of service at any intersection because the trips will be somewhat dispersed over a large area and the workers would not all arrive at the site at the exact same time. Therefore, the work force

at each affected facility is not expected to significantly increase as a result of the proposed project. Further, the conclusion of no significant transportation impacts based on the workforce is consistent with the transportation analyses in the Environmental Impact Reports prepared for six refineries in accordance with the CARB Phase III Reformulated Gasoline requirements. Specifically, the number of construction workers for each of the six projects ranged from approximately 200 to 700 daily construction worker trips and each of these projects was concluded to have no significant transportation impacts.

The operation-related traffic will be primarily for deliveries of aqueous ammonia on a monthly, and for the removal of spent catalyst and delivery of fresh catalyst every five years. It is expected that affected facilities will receive ammonia from a local ammonia supplier located in the district. Deliveries of aqueous ammonia would be made to the affected facilities by tanker truck via public roads. The maximum capacity of an ammonia tanker truck is approximately 7,000 gallons. Based on the onsite storage capacity and consumption of ammonia for past projects analyzed by the SCAQMD and the projections for future ammonia storage summarized in Table 3-4, the "worst-case" assumption for delivery frequency from a supplier would be to deliver approximately 2,000 gallons of ammonia in one day. Taking into consideration the "worst-case" ammonia delivery transportation schedule, the proposed project is still not expected to exceed, either individually or cumulatively, the current level of service of the areas surrounding the affected facilities during operations. Thus, the projected increase of traffic due to construction and operational activities is expected to be minimal and thus, the traffic impacts are expected to be less than significant for the proposed project.

Though some of the facilities that will be affected by the proposed project are located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, actions that would be taken to comply with the proposed project, such as installing new air pollution control equipment, are not expected to significantly influence or alter air traffic patterns. Further, the size and type of air pollution control devices that would be installed would not be expected to affect navigable air space because they would not be taller than other equipment at affected facilities. Thus, the proposed project would not result in a change in air traffic patterns, an increase in traffic levels or a change in location that results in substantial safety risks.

The siting of each existing affected facility is consistent with surrounding land uses and traffic/circulation in the surrounding areas of the affected facilities. Thus, the proposed project is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities. Aside from the temporary effects due to a slight increase in truck traffic for those facilities that will undergo construction activities during the installation of SCR units, the proposed project is not expected to alter the existing long-term circulation patterns. The proposed project is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur. The proposed project does not involve construction of any roadways, so there would be no increase in roadway design feature that could increase traffic hazards. Emergency access at each affected facility is not expected to be impacted by the proposed project. Further, each affected facility is expected to continue to maintain its existing emergency access gates.

Each affected facility will be required to provide parking for the construction workers, as applicable, either on or within close proximity to each facility. No additional parking will be

needed after completion of the construction phase because the work force at each facility is not expected to significantly increase as a result of the proposed project.

Construction and operation activities resulting from the proposed project are not expected to conflict with policies supporting alternative transportation since the proposed project does not involve or affect alternative transportation modes (e.g. bicycles or buses) because the construction and operation activities related to the proposed project will occur solely in existing industrial, commercial, and institutional areas. Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of the proposed project.

SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines §15126(c) requires an environmental analysis to consider "any significant irreversible environmental changes which would be involved if the proposed action should be implemented." This EA identified hazards and hazardous materials as the environmental area potentially adversely affected by the proposed project. The NOP/IS also identified air quality as significant, but after further analysis, the topic of air quality was determined not to be significant.

Significant adverse impacts from accidental releases of aqueous ammonia may be considered irreversible. Facility operators that install SCR units are likely to operate these systems for the lifetime of the equipment. Further, the delivery and storage of aqueous ammonia on-site would continue to have potential significant accidental release consequences for the lifetime of the equipment.

POTENTIAL GROWTH-INDUCING IMPACTS

CEQA Guidelines §15126(d) requires an environmental analysis to consider the "growth-inducing impact of the proposed action." Implementing PAR 1146 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.

CONSISTENCY

CEQA Guidelines §15125(d) requires an EIR to discuss any inconsistencies between a proposed project and any applicable general plans or regional plans. The Southern California Association of Governments (SCAG) and the SCAQMD have developed, with input from representatives of local government, the industry community, public health agencies, the EPA - Region IX and CARB, guidance on how to assess consistency within the existing general development planning process in the Basin. Pursuant to the development and adoption of its Regional Comprehensive Plan Guide (RCPG), SCAG has developed an Intergovernmental Review Procedures Handbook (June 1, 1995). The SCAQMD also adopted criteria for assessing consistency with regional plans and the AQMP in its CEQA Air Quality Handbook. The following sections address the consistency between PAR 1146 and relevant regional plans pursuant to the SCAG Handbook and SCAQMD Handbook.

Consistency with Regional Comprehensive Plan and Guide (RCPG) Policies

The RCPG provides the primary reference for SCAG's project review activity. The RCPG serves as a regional framework for decision making for the growth and change that is anticipated during the next 20 years and beyond. The Growth Management Chapter (GMC) of the RCPG contains population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of

implementation and review. It states that the overall goals for the region are to (1) re-invigorate the region's economy, (2) avoid social and economic inequities and the geographical isolation of communities, and (3) maintain the region's quality of life.

Consistency with Growth Management Chapter (GMC) to Improve the Regional Standard of Living

The Growth Management goals are to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. PAR 1146 in relation to the GMC would not interfere with the achievement of such goals, nor would it interfere with any powers exercised by local land use agencies. Further, PAR 1146 will not interfere with efforts to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.

Consistency with Growth Management Chapter (GMC) to Provide Social, Political and Cultural Equity

The Growth Management goals to develop urban forms that avoid economic and social polarization promotes the regional strategic goals of minimizing social and geographic disparities and of reaching equity among all segments of society. Consistent with the Growth Management goals, local jurisdictions, employers and service agencies should provide adequate training and retraining of workers, and prepare the labor force to meet the challenges of the regional economy. Growth Management goals also includes encouraging employment development in job-poor localities through support of labor force retraining programs and other economic development measures. Local jurisdictions and other service providers are responsible to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection. Implementing PAR 1146 has no effect on and, therefore, is not expected to interfere with the goals of providing social, political and cultural equity.

Consistency with Growth Management Chapter (GMC) to Improve the Regional Quality of Life

The Growth Management goals also include attaining mobility and clean air goals and developing urban forms that enhance quality of life, accommodate a diversity of life styles, preserve open space and natural resources, are aesthetically pleasing, preserve the character of communities, and enhance the regional strategic goal of maintaining the regional quality of life. The RCPG encourages planned development in locations least likely to cause environmental impacts, as well as supports the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals. While encouraging the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites, the plan discourages development in areas with steep slopes, high fire, flood and seismic hazards, unless complying with special design requirements. Finally, the plan encourages mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and develop emergency response and recovery plans. PAR 1146 implements an AQMP control measure, which results in improving air quality in the region. Therefore, in relation to the GMC, PAR 1146 is not expected to interfere, but rather help with attaining the air quality portion of these goals.

Consistency with Regional Mobility Element (RMP) and Congestion Management Plan (CMP)

PAR 1146 is consistent with the RMP and CMP since no significant adverse impact to transportation/circulation will result from installing ultra-low NOx burners and SCR units on boilers, steam generators, and process heaters. For the eight Group I units and the nine Group II units that will undergo SCR installation, there will be a maximum increase of four one-way truck transport trips to deliver fresh catalyst and dispose of, or recycle spent catalyst per SCR unit and two one-way trips to deliver aqueous ammonia per storage tank. Because trips would not likely all occur on the same day and because they would be dispersed over a wide area, PAR 1146 is not expected to significantly adversely affect circulation patterns or congestion management.

CHAPTER 5

ALTERNATIVES

INTRODUCTION

This Final ~~Draft~~ EA 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 §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 an environmental assessment than is required for an EIR under CEQA.

Four alternatives to PAR 1146 are summarized in Table 5-1: Alternative A (No Project), Alternative B (Ultra-Low NOx Burners), Alternative C (Expedited Compliance), and Alternative D (End of Life Replacement). Pursuant to the requirements in CEQA Guidelines §15126.6(b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potential air quality impacts from each of the project alternatives for the individual rule components that comprise PAR 1146 is provided in Table 5-2. Aside from the topic of hazards and hazardous materials, no other environmental topics were analyzed because it was concluded in the NOP/IS prepared for the proposed project that they would not be adversely affected by the proposed project. However, for the project alternatives, both topics of air quality and hazards and hazardous materials were determined to have significant adverse impacts for Alternatives C and D. For these reasons, the proposed project is considered to provide the best balance between emission reductions and the adverse air quality impacts due to construction and air quality and hazard and hazardous materials during operation. Therefore, the proposed project is preferred over the project alternatives.

ALTERNATIVES REJECTED AS INFEASIBLE

A CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and explain the reasons underlying the lead agency's determination [CEQA Guidelines §15126.6(c)]. No alternative was specifically rejected as being infeasible.

LOWEST TOXIC ALTERNATIVE

In accordance with SCAQMD's policy document Environmental Justice Program Enhancements for FY 2002-03, Enhancement II-1 recommends that all SCAQMD CEQA assessments include 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 air emissions. With respect to the proposed project, a lowest air toxics alternative would be to not use SCR technology because it relies on ammonia for controlling NOx emissions. Alternative B considers the potential impacts associated with reducing NOx emissions by 0.95 ton per day. Alternative B would have higher NOx emissions limits relative to the proposed project, with the lowest at 9 ppm. Alternatively,

PAR 1146 is expected to reduce NOx emissions by 1.17 tons per day because some equipment would be subject to a NOx limit of five ppm. This means that under Alternative B, facility owners/operators would not need to install SCR units and in turn, there would be no need for the use of aqueous ammonia, a hazardous material, depending on the form and concentration. Instead, all of the affected equipment under Alternative B would be eligible for retrofitting with ultra-low NOx burners, which are assumed to be the most cost-effective choice for achieving the desired emission reductions. With the elimination of potential new SCR units under Alternative B, there will be no need for new ammonia storage tanks, no demand for ammonia in terms of truck deliveries, and no ammonia slip produced. Therefore, as compared to the proposed project and the other alternatives under consideration that also rely on the use of ammonia and SCR technology for compliance, Alternative B is the lowest toxics alternative.

DESCRIPTION OF ALTERNATIVES

The following proposed alternatives were developed by modifying specific 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.

The initial analysis of the proposed project in the NOP/IS determined that, of the amendments proposed to Rule 1146, only the components that pertain to the lowered NOx emission limits could entail physical modifications to the affected equipment that could have potential adverse significant impacts. As such, the following four alternatives were developed by identifying and modifying major components of PAR 1146. Specifically, the primary components of the proposed alternatives that have been modified are the NOx emission limits and the interim and final compliance dates. The alternatives, summarized in Table 5-1 and described in the following subsections, include the following: Alternative A (No Project); Alternative B (Ultra-Low NOx Burners), Alternative C (Expedited Compliance), and Alternative D (End of Life Replacement). Unless otherwise specifically noted, all other components of the project alternatives are identical to the components of PAR 1146. The following subsections provide a brief description of each alternative.

Alternative A - No Project

Alternative A or 'no project' means that PAR 1146 would not be adopted and the current universe of equipment will continue to be maintained at their current operations without being required to further reduce NOx emissions. However, by not adopting the overall NOx emission reductions as proposed for PAR 1146, the current version of Rule 1146 would not implement AQMP Control Measure CM#2007MCS-01: Facility Modernization. In addition, the 'no project' alternative may not be consistent with state requirements to implement all feasible measures. In summary, Alternative A, the 'no project' alternative, does not achieve the goals of the proposed project because it does not implement the AQMP control measure. While no significant adverse secondary environmental impacts would result from the 'no project' alternative, it is not necessarily the environmentally superior alternative in accordance with CEQA Guidelines §15126.6(e)(2) because NOx emissions would continue to be emitted at current levels, thus, not improving air quality in the district.

Alternative B – Ultra-Low NOx Burners

Alternative B is comprised of less stringent NOx limits that apply to the same equipment universe, but compliance dates are a delayed to a later timeframe than what is proposed in PAR 1146. To comply with Alternative B, facility owners and operators would be expected to retrofit

Table 5-1
Summary of PAR 1146 & Project Alternatives

Rule Components						
Group No.	**Heat Input & Fuel Type**	**Proposed Project**	**Alternative A:** No Project	**Alternative B:** Ultra-Low NOx Burners	**Alternative C:** Expedited Compliance	**Alternative D:** End of Life Replacement
--	Any Units; non-gaseous fuel	40 ppm NOx by date of adoption	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project
--	All Units; gaseous fuel	30 ppm NOx or 0.036 lb NOx/mmBTU* by date of adoption	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project	Same as Proposed Project
I	≥ 75 mmBTU/hr; natural gas	5 ppm NOx or 0.0062 lb NOx/mmBTU P/C by 01/01/12 F/C by 01/01/13	30 ppm NOx or 0.036 lb NOx/mmBTU	9 ppm NOx or 0.011 lb NOx/mmBTU P/C by 01/01/14 F/C by 01/01/15	Same limits as Proposed Project but with: P/C by 01/01/11 F/C by 01/01/12	Same limits as Proposed Project but with P/C within 15 years from date of installation
II	≤ 20 x < 75 mmBTU/hr; gaseous fuel but not landfill & digester gas	Standard: 9 ppm NOx or 0.011 lb NOx/mmBTU* 75% of units: C/P by 01/01/10 P/C by 01/01/11 F/C by 01/01/12 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14 Enhanced: 5 ppm NOx or 0.0062 lb NOx/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/13 F/C by 01/01/14 100% of units: C/P by 01/01/11 P/C by 01/01/15 F/C by 01/01/16	30 ppm NOx or 0.036 lb NOx /mmBTU*	12 ppm NOx or 0.015 lb NOx/mmBTU* 100% of units: C/P by 01/01/13 P/C by 01/01/15 F/C by 01/01/16	5 ppm NOx or 0.0062 lb NOx/mmBTU* 100% of units: C/P by 01/01/10 P/C by 01/01/11 F/C by 01/01/12	5 ppm NOx; or, 0.0062 lb NOx/mmBTU* but with P/C within 15 years from date of installation

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Table 5-1 (concluded)
Summary of PAR 1146 & Project Alternatives

Rule Components						
Group No.	**Heat Input & Fuel Type**	**Proposed Project**	**Alternative A:** No Project	**Alternative B:** Ultra-Low NOx Burners	**Alternative C:** Expedited Compliance	**Alternative D:** End of Life Replacement
III	≤ 5 x < 20 mmBTU/hr includes units operated at schools & universities rated ≤ 5 mmBTU/hr; gaseous fuel but not landfill & digester gas	9 ppm NOx or 0.011 lb NOx/mmBTU* 75% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13 100% of units: C/P by 01/01/11 P/C by 01/01/14 F/C by 01/01/15	30 ppm NOx or 0.036 lb NOx /mmBTU*	15 ppm NOx or 0.019 lb NOx/mmBTU* 100% of units: C/P by 01/01/15 P/C by 01/01/16 F/C by 01/01/17	Same limits as proposed project with: 100% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13	Same limits as Proposed Project with P/C within 15 years from date of installation
III	atmospheric units	12 ppm NOx or 0.015 lb NOx/mmBTU* 100% of units: C/P by 01/01/10 P/C by 01/01/13 F/C by 01/01/14	30 ppm NOx or 0.036 lb NOx /mmBTU*	15 ppm NOx or 0.019 lb NOx/mmBTU* 100% of units: C/P by 01/01/15 P/C by 01/01/16 F/C by 01/01/17	Same limits as proposed project with: 100% of units: C/P by 01/01/11 P/C by 01/01/12 F/C by 01/01/13	Same limits as Proposed Project with P/C within 15 years from date of installation
--	≤ 90,000 therms/yr; Any fuel	30 ppm NOx by 01/01/15 or burner replacement, whichever occurs later	No limit	40 ppm NOx by 01/01/17 or burner replacement, whichever occurs later	20 ppm NOx by 01/01/15	Same limit as Proposed Project with P/C within 15 years from date of installation
--	Any Units; landfill gas	25 ppm NOx with F/C by 01/01/15	30 ppm NOx	25 ppm NOx with F/C by 01/01/18	25 ppm NOx with F/C by 01/01/13	25 ppm NOx with F/C by 01/01/15
--	Any Units; digester gas	15 ppm NOx with F/C by 01/01/15	30 ppm NOx	15 ppm NOx with F/C by 01/01/18	15 ppm NOx with F/C by 01/01/13	15 ppm NOx with F/C by 01/01/15

* NOx limits identified in terms of lb/mmBTU are applicable to natural gas-fired units only.
Key: C/P = Compliance Plan; P/C = Application for Permit to Construct; F/C = Full Compliance

Table 5-2
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project	Alternative A: No Project	Alternative B: Ultra-Low NOx Burners	Alternative C: Expedited Compliance	Alternative D: End of Life Replacement
Air Quality	**Decreases total NOx emissions by 1.17 tons per day as follows:** Group I: 0.16 ton per day by 01/01/13 Group II: 0.54 ton per day (Standard: 75% of 0.51 ton/day by 01/01/12 & 100% by 01/01/14; or, Enhanced: 75% of 0.03 ton/day by 01/01/14 & 100% by 01/01/16) Group III: 0.35 ton per day with : 75% of 0.29 ton/day for sealed units by 01/01/13 and 100% by 01/01/15; and 100% of 0.05 ton/day for atmospheric units by 01/01/14 Low Usage: 0.06 ton per day Landfill Units: 0.04 ton per day by 01/01/15 Digester Gas Units: 0.02 ton per day by 01/01/15	**No change in NOx emissions.**	**Decreases total NOx emissions by 0.95 ton per day as follows:** Group I: 0.14 ton per day by 01/01/15 Group II: 0.46 ton per day by 01/01/16 Group III: 0.25 ton per day by 01/01/17 Low Usage: 0.04 ton per day by 01/01/17 or later Landfill Units: 0.04 ton per day by 01/01/18 Digester Gas Units: 0.02 ton per day by 01/01/18	**Decreases total NOx emissions by 1.29 tons per day as follows:** Group I: 0.16 ton per day by 01/01/12 Group II: 0.65 ton per day by 01/01/12 Group III: 0.35 ton per day by 01/01/13 Low Usage: 0.08 ton per day by 01/01/15 Landfill Units: 0.04 ton per day by 01/01/13 Digester Gas Units: 0.02 ton per day by 01/01/13	**Decreases total NOx emissions by 1.27 tons per day as follows:** Group I: 0.16 tons per day with P/C within 15 years from installation date Group II: 0.65 ton per day with P/C within 15 years from installation date Group III: 0.35 ton per day with P/C within 15 years from installation date Low Usage: 0.06 ton per day with P/C within 15 years from installation date Landfill Units: 0.04 ton per day by 01/01/15 Digester Gas Units: 0.02 ton per day by 01/01/15 *P/C = Application for Permit to Construct
Air Quality Impacts Significant?	Not Significant for any pollutant	Not Significant for any pollutant but would likely violate HSC §§40440 and would not comply with all feasible measures specified by RACT and Control Measure MCS-01.	Not Significant for any pollutant but achieves less emission reductions by the same or later compliance dates than the proposed project.	Significant for NOx, VOC, CO, PM10, and PM2.5 during construction Significant for NOx during operation overlap in 2011 Achieves more emission reductions earlier than the proposed project but with major construction emissions penalty in 2011.	Potentially significant for NOx, VOC, CO, PM10, and PM2.5 during construction depending on number of construction overlap. Achieve slightly more emission reductions than the proposed project but less than Alternative C, and at a much later compliance timeline due to varying ages of existing equipment.

Table 5-2 (concluded)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project	Alternative A: No Project	Alternative B: Ultra-Low NOx Burners	Alternative C: Expedited Compliance	Alternative D: End of Life Replacement
Hazard Impacts	Significant for operations associated with the use and storage of aqueous ammonia	No impacts	Not Significant (less than the proposed project)	Significant for operations associated with the use and storage of aqueous ammonia (greater than the proposed project)	Significant for operations associated with the use and storage of aqueous ammonia (emissions-wise, equivalent to the proposed project, but for compliance timing, less than the proposed project)

their existing equipment with ultra-low NOx burners in order to achieve the NOx limits. Because the lowest NOx limit under Alternative B would be nine ppm, installations of SCR systems would not likely occur since ultra-low NOx burners have been demonstrated to achieve the nine ppm limit. Having less stringent NOx emission limits implemented over a longer period of time means that the overall NOx emission reductions attributable to Alternative B will be less, and in smaller increments than the proposed project and will be attained more slowly. While no significant adverse secondary environmental impacts would result from implementing Alternative B, it achieves less emission reductions by the same or later compliance dates as the proposed project.

Alternative C – Expedited Compliance

Alternative C would impose either the same or more stringent NOx limits that would be applicable to the same equipment universe as the proposed project, but on an expedited compliance schedule. Two equipment categories under Alternative C would have more stringent NOx emission limits: Group II equipment and low therm usage units. Under Alternative C, more equipment units would be expected to have SCR units installed in order to achieve the lowered NOx emission limits. Having equivalent or more stringent NOx emission limits implemented over a shorter period of time means that the overall NOx emission reductions attributable to Alternative C will be slightly more than the proposed project, in slightly larger increments for Group II equipment and low therm usage units, and will be attained more quickly. However, significant adverse secondary environmental impacts would result from implementing Alternative C, because SCR units would need to be installed on Group II units in order to achieve the lowered NOx emission limit of five ppm. Having the overall NOx emission reductions occur sooner means that the emission reductions will be attained more quickly and the peak "worst-case" construction impacts will be more concentrated than the proposed project.

Alternative D – End of Life Replacement

Alternative D is the end of life replacement alternative with the same NOx emission reduction targets as the proposed project, but the timing of compliance is 15 years from the date the equipment was installed. The quantity of projected NOx reductions for Alternative D is approximately 1.27 tons per day which is slightly more than the proposed project, but would only occur at the end of life of the affected equipment. One equipment category, Group II units, under Alternative D would have more a stringent NOx emission limit of five ppm than the proposed project for the same equipment. This means that in addition to Group I units, Group II equipment would be expected to have SCR units installed in order to achieve the lower NOx limit.

COMPARISON OF THE ALTERNATIVES

The Environmental Checklist (see Chapter 2 of the Initial Study in Appendix C) identified only air quality and hazards and hazardous materials as the environmental areas that could be significantly adversely affected by the proposed project. Further evaluation of potential impacts in Chapter 4 of this Environmental Assessment determined that the proposed project would not generate significant adverse project-specific impacts for air quality. Instead, the project-specific hazards and hazardous materials impacts were concluded to be significant from the use and storage of aqueous ammonia.

The following sections briefly describe potential adverse impacts that may be generated by each project alternative. Potential adverse impacts for the environmental topics 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 and hazards and hazardous materials were identified that could be significantly adversely affected by implementing any project alternative.

Air Quality

Alternative A - No Project

Unlike PAR 1146, it is not anticipated that Alternative A would generate significant adverse impacts during construction or operational activities because the owners/operators of affected units would not be expected to replace burners with ultra-low NOx burners or install SCR units that could generate construction and operation emissions. Instead, owners/operators of affected facilities would continue existing operations that would comply with all applicable SCAQMD, CARB and EPA requirements. By not adopting the proposed project, current operations mean that each facility can continue to operate their Rule 1146 equipment and emit NOx at the 30 ppm levels currently allowed. This means that there would be no NOx reductions that would be applicable to all Rule 1146 facilities and health benefits from reducing NOx overall will not be realized. Further, by not implementing NOx emission reductions, AQMP Control Measure CM#2007MCS-01: Facility Modernization, would not be implemented. In summary, Alternative A, the 'no project' alternative, does not achieve the goals of the proposed project because it does not implement the AQMP control measure or comply with sate law to implement all feasible mitigation measures.

Alternative B – Ultra-Low NOx Burners

Because Alternative B proposes less stringent NOx emission limits over the longer period of time as the proposed project, less emission reductions would be realized for the same number of equipment (e.g., 0.95 ton per year for Alternative B versus 1.17 tons per year for the proposed project). Due to the higher emission limits, it is not anticipated that owners/operators of the affected units would have to install control equipment that could generate construction emissions (e.g., SCRs). Further, because there will be no SCR installations, no operational emissions due to ammonia deliveries and catalyst replacement activities will occur. Instead, owners/operators of the affected units would be able to achieve the additional NOx reductions by installing ultra-low NOx burners, which has been previously discussed in this Final ~~Draft~~ EA as not generating construction or operational emissions. Unlike the PAR 1146, it is not anticipated that the installation of ultra-low NOx burners in accordance with Alternative B would generate significant adverse construction or operational air quality impacts. If Alternative B were implemented, less NOx reductions would be achieved and less health benefits from reducing NOx overall will be realized. Alternative B does not achieve as great of NOx emission reduction benefits as the proposed project. Table 5-3 summarizes the NOx emission reduction benefits per year for Alternative B.

With regard to greenhouse gas emissions, Table 5-4 summarizes the CO2 emissions increase due the construction activities associated with the installation of ultra-low NOx burners and the two percent fuel penalty for operating the equipment after the ultra-low NOx burners are installed. Peak CO2 emissions of approximately 151 metric tons per year occur in 2016, when the largest amount of equipment, 739 Group III units and 133 low usage units, would be expected to have ultra-low NOx burners installed within one year. However, by 2018, an increase of approximately 0.04 metric ton per year or 84 pounds per year of CO2 emissions are expected to result from operating ultra-low NOx burners as part of implementing Alternative B.

Table 5-3
Alternative B: Overall [1] Net NOx Emission Reductions (lbs/day)

Daily NOx Emission Reductions	Compliance Year					
	2014	***2015***	***2016***	***2017***	***2018***	***2019***
Group I Units (8) via Ultra-Low NOx burners	0	-270	-270	-270	-270	-270
Group II (173) via Ultra-Low NOx burners	0	0	-929	-929	-929	-929
Group III (739) via Ultra-Low NOx burners	0	0	0	-507	-507	-507
Low Usage Units (133)	0	0	0	-80	-80	-80
Landfill Units (9)	0	0	0	0	-79	-79
Digester Gas Units (9 ~~6~~)	0	0	0	0	-39 ~~-34~~	-39 ~~-34~~
Accumulated Total NOx Emission Reductions	**0**	**-270**	**-1,199**	**-1,786**	**-1,904 ~~-1899~~**	**-1,904 ~~-1899~~**
Peak Daily NOx Increases during Construction of Ultra-Low NOx Burners for all units	7	7	7	7	0	0
Net Accumulated NOx Emission Reductions (Increases) after Construction	**7**	**-263**	**-1,192**	**-1,779**	**-1,904 ~~-1899~~**	**-1,904 ~~-1899~~**
NOX SIGNIFICANCE THRESHOLD (For Construction Activities)	100	100	100	100	100	100
SIGNIFICANT FOR NOX?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[1] Because NOx emission reductions are permanent, they accumulate each year until total NOx emissions are realized.

Table 5-4

Alternative B: Overall CO2 Increases Due to Installation & Operation of Ultra-Low NOx Burners (metric tons/year)[1]

Annual CO2 Emission Increases	Compliance Year					
	2014	***2015***	***2016***	***2017***	***2018***	***2019***
Installation of Ultra-Low NOx Burners on All Units	1.39	29.97	151.06	2.60	0	0
Operation of Ultra-Low NOx Burners on 8 Group I Units	0	0.004	0.004	0.004	0.004	0.004
Operation of Ultra-Low NOx Burners on 173 Group II Units	0	0	0.016	0.016	0.016	0.016
Operation of Ultra-Low NOx Burners on 739 Group III Units	0	0	0	0.011	0.011	0.011
Operation of Ultra-Low NOx Burners on 133 Low Therm units	0	0	0	0.001	0.001	0.001
Operation of Ultra-Low NOx Burners on 9 Landfill Units	0	0	0	0	0.005	0.005
Operation of Ultra-Low NOx Burners on 9 ~~6~~ Digester Gas Units	0	0	0	0	0.001	0.001
TOTAL CO2 Increases Due to Installation and 2% Fuel Penalty During Operation	**1.39**	**29.97**	**151.08**	**2.63**	**0.04**	**0.04**

[1] 1 metric ton = 2,205 pounds

Alternative C – Expedited Compliance

Alternative C is almost the same as the proposed project except that it contains lower emission limits applicable to Group II units (e.g., equipment rated between 20 and 75 mmBTU/hr) and low usage units (e.g., fuel usage at or less than 90,000 therms per year). Alternative C proposes that Group II units comply with a more stringent NOx emission limit (five ppm) than the proposed project by the same timelines as would be required by the proposed project for 75 percent of the units following the standard compliance option (e.g., full compliance by January 1, 2012). This means that, in addition to the Group I units, owners/operators of Group II units would also be expected to install SCR systems (173 systems for 173 units) in order to achieve the lower NOx emission limit. Alternative C also proposes that low usage units comply with a

20 ppm NOx limit by January 1, 2015. This means that owners/operators of these units would be expected to install ultra-low NOx burners to comply with the lowered NOx limit.

Alternative C shows slightly more NOx emission reductions when compared to the proposed project (1.29 tons per day versus 1.17 tons per day). However, despite the slight increase in NOx emission reductions when compared to the proposed project, Alternative C is unattractive because the substantial increase in total SCRs that would need to be installed creates a large cost effectiveness with little additional emission control benefit.

Table 5-5 summarizes the anticipated NOx emission reductions during peak daily "worst-case" construction activities with operational overlap for Alternative C. The peak construction activities occur in year 2011 and are significant for NOx. The construction of 181 SCR units (eight Group I units plus 173 Group II units) all in one year, 2011, means that construction and operational activities will overlap. To take into account design and engineering, ordering and purchasing equipment, permitting and environmental review, availability of construction crews, budgeting, and any other construction projects on site, it can take up to six months to construct SCR for a large boiler.

As such, this analysis assumes that a maximum of 181 SCR units could potentially have overlapping construction occurring during any six-month period in compliance year 2011. This analysis assumes that within any six-month construction period a maximum of 181 SCR units with 181 new ammonia storage tanks could be under construction at any one time.

Despite the extended final compliance date, for the purpose of conducting a "worst-case" analysis, based on the construction assumptions, as shown in Table 5-6, Alternative C is expected to generate significant adverse air quality impacts for NOx, VOC and CO, PM10 and PM2.5 during construction. For both the proposed project and Alternative C, once the new SCRs are in place, an overall net NOx air quality benefit is expected from PAR 1146. However, as shown in Table 5-5, the construction activities associated with installing air pollution control equipment are expected and have the potential to generate significant adverse secondary air quality impacts at levels much higher than what is estimated for the proposed project. Consequently, reducing the quantity of NOx emissions from these facilities will provide an air quality benefit in the long term. It should be noted that the NOx emission reduction benefits will overlap the period of construction to install SCRs and ammonia storage tanks, but construction NOx emissions will still exceed the applicable NOx construction significance threshold in 2011.

With regard to greenhouse gas emissions, Table 5-6 summarizes the CO2 emissions increase due to construction of SCRs and installation of ultra-low NOx burners along with the two percent fuel penalty for operating equipment with the ultra-low NOx burners and the five percent fuel penalty for operating SCRs. Peak CO2 emissions of approximately 40,772 metric tons per year occur in 2011, when the largest amount of construction activities are expected to occur. However, by 2016, an operational increase of approximately 28 metric tons per year of CO2 emissions is expected to result from implementing Alternative C.

Taking into consideration the overlapping construction and operational emissions summarized in Table 5-5, complying with Alternative C would achieve the same overall net decrease of 1.17 tons per day of NOx as the proposed project, but with more concentrated construction impacts during year 2011.

Table 5-5
Alternative C: Overall [1] Net NOx Emission Reductions During Peak Daily "Worst-Case" Construction Activities with Operational Overlap (lbs/day)

Daily NOx Emission Reductions	Compliance Year					
	2011	***2012***	***2013***	***2014***	***2015***	***2016***
Group I Units via SCRs (8)	0	-322	-322	-322	-322	-322
Group II Units (173) via SCRs	0	-1,291	-1,291	-1,291	-1,291	-1,291
Group III Units (739) via Ultra-Low NOx burners	0	0	-692	-692	-692	-692
Low Usage Units (133)	0	0	0	0	-160	-160
Landfill Units (9)	0		-79	-79	-79	-79
Digester Gas Units (9 ~~6~~)	0		-39 ~~-34~~	-39 ~~-34~~	-39 ~~-34~~	-39 ~~-34~~
Accumulated Total NOx Emission Reductions	**0**	**-1,613**	**-2,423** **~~-2,418~~**	**-2,423** **~~-2,418~~**	**-2,583** **~~-2,578~~**	**-2,583** **~~-2,578~~**
Daily NOx Increases during Construction of SCRs	7,284	0	0	0	0	0
Daily NOx Increases during Construction of Ultra-Low NOx Burners	0	8	0	7	0	0
Daily NOx Increases during Overlapping Operation	0	248	248	248	248	248
Net Accumulated NOx Emission Reductions (Increase) after Construction	**(7,284)**	**-1,357**	**-2,175** **~~-2,170~~**	**-2,168** **~~-2,163~~**	**-2,335** **~~-2,330~~**	**-2,335** **~~-2,330~~**
NOX SIGNIFICANCE THRESHOLD (For Construction Activities)	100	100	100	100	100	100
SIGNIFICANT FOR NOX?	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**

[1] Because NOx emission reductions are permanent, they accumulate each year until total NOx emissions are realized.

Table 5-6
Alternative C: Overall CO2 Increases Due to Construction Activities with Operational Overlap (metric tons/year)[1]

Annual CO2 Emission Increases	Compliance Year 2011	2012	2013	2014	2015	2016
Construct 8 SCRs on Group I Units[2]	1801	0	0	0	0	0
Construct 173 SCRs on Group II Units[2]	38,957	0	0	0	0	0
Install Ultra-Low NOx Burners 739 Group III Units, 133 Low Therm units, 9 Landfill Units, and 9 ~~6~~ Digester Gas Units	0	131	0	230	0	0
CO2 Increases Due to Construction	**40,758**	**131**	**0**	**230**	**0**	**0**
Operational Overlap – Ammonia Deliveries	13.78	13.78	13.78	13.78	13.78	13.78
Operational Overlap – Catalyst Change-out/Replacement	0	0	0	0	0	13.78
5% Fuel Penalty for SCRs	0.051	0.051	0.051	0.051	0.051	0.051
2% Fuel Penalty for Ultra-Low NOx Burners	0	0	0.017	0.017	0.017	0.017
CO2 Increases Due to Operation	**14**	**14**	**14**	**14**	**14**	**28**
TOTAL CO2 INCREASES	**40,772**	**145**	**14**	**244**	**14**	**28**

[1] 1 metric ton = 2,205 pounds

[2] Based on 130 days of construction per year.

Alternative D – End of Life Replacement

Alternative D is almost the same as the proposed project except that it contains lower emission limits applicable to Group II units and the compliance timeline for all of the equipment is based on 15 years from when the equipment was originally installed. Alternative D proposes that Group II units comply with a more stringent NOx emission limit (five ppm) than the proposed project, but within 15 years from when the equipment was originally installed. This means that owners/operators of Group II units would be expected to install 174 SCR systems on 174 units in order to achieve the lower NOx emission limit, but the construction would be spread out over 15 years. Owners/operators of all other units subject to Alternative D would be expected to install

ultra-low NOx burners to comply with the various NOx limits (which are the same as those for the proposed project.

Although Alternative D shows slightly more NOx emission reductions when compared to the proposed project (1.27 tons per day versus 1.17 tons per day), there are two key differences between the two. It is anticipated that the proposed project would require most of the 17 units to be retrofitted with SCRs over a period of two years (2012 and 2013)[8], while it is assumed for Alternative D that 181 units, more than 10 times the amount in the proposed project, would need SCRs and aqueous ammonia tanks. The second difference between Alternative D and the proposed project is that the SCRs and ultra-low NOx burners would need to be installed within 15 years from the original equipment installation date.

Table 5-7 summarizes the anticipated NOx emission reductions during peak daily "worst-case" construction activities with operational overlap for Alternative C. Because the peak construction activities can occur in any year, for the purposes of determining a peak daily "worst-case" analysis, the construction activities are assumed to be concentrated over any five-year period and are shown to be significant for NOx. The construction of 181 SCR units (eight Group I units plus 173 Group II units) spread out over any five-year period, means that construction and operational activities will overlap. To take into account design and engineering, ordering and purchasing equipment, permitting and environmental review, availability of construction crews, budgeting, and any other construction projects on site, it can take up to six months to construct SCR for a large boiler.

As such, this analysis assumes that a maximum of 181 SCR units could potentially have overlapping construction occurring during any six-month period in any five-year period. This analysis assumes that within any six-month construction period a maximum of 181 SCR units with 181 new ammonia storage tanks could be under construction within any five-year period. Despite the extended final compliance date based on the equipment age, for the purpose of conducting a "worst-case" analysis, based on the construction assumptions as shown in Appendix B, Alternative D is expected to generate significant adverse air quality impacts for NOx, VOC and CO, and PM10 during construction. For both the proposed project and Alternative D, once the new SCRs are in place, an overall net NOx air quality benefit is expected from PAR 1146. However, as shown in Table 5-7, the construction activities associated with installing air pollution control equipment are expected and have the potential to generate significant adverse secondary air quality impacts at levels much higher than what is estimated for the proposed project. Consequently, reducing the quantity of NOx emissions from these facilities will provide an air quality benefit in the long term. It should be noted that the NOx emission reduction benefits will overlap the period of construction to install SCRs and ammonia storage tanks.

[8] The enhanced compliance option for Group II units would allow 75 percent of the Group II units to be under construction in 2013, with the remainder under construction in 2015.

Table 5-7
Alternative D: Overall [1] Net NOx Emission Reductions During Peak Daily "Worst-Case" Construction Activities with Operational Overlap (lbs/day)

Affected Units	Daily NOx Emission Reductions[2]
Group I Units via SCRs (8)	**-322**
Group II Units (173) via SCRs	**-1,291**
Group III Units (739) via Ultra-Low NOx burners	**-692**
Low Usage Units (133)	**-120**
Landfill Units (9)	**-79**
Digester Gas Units (96)	**-39 ~~-34~~**
Accumulated Total NOx Emission Reductions	**-2,543 ~~-2,538~~**
Daily NOx Increases during Construction of SCRs[3]	**1,457**
Daily NOx Increases during Construction of Ultra-Low NOx Burners	**7**
Daily NOx Increases during Overlapping Operation	**248**
Net Accumulated NOx Emission Reductions (Increase) after Construction	**-831 ~~-826~~**
NOX SIGNIFICANCE THRESHOLD (For Construction Activities)	**100**
SIGNIFICANT FOR NOX?	**NO**

[1] Because NOx emission reductions are permanent, they accumulate each year until total NOx emissions are realized.
[2] Reductions are expected to complete within 16 years of the original equipment installation date.
[3] Assume that peak daily "worst-case" construction activities are concentrated over a five-year period.

With regard to greenhouse gas emissions, the CO2 emissions increase due to construction activities as well as the two percent fuel penalty for utilizing ultra-low NOx burners and the five percent fuel penalty for utilizing SCRs will be the same as analyzed for Alternative C, except without the specified compliance year. Upon full compliance, an operational increase of approximately 28 metric tons per year of CO2 emissions is expected to result from implementing Alternative D.

When taking into consideration the overlapping construction and operational emissions summarized in Table 5-7, the estimated net NOx emission reductions from Alternative D to 0.42 ton per day upon final compliance, Alternative D would achieve a total decrease of NOx emissions of 1.27 tons per day.

Though the total quantity of proposed NOx reductions (without taking into account construction emissions) is less for the proposed project than for Alternative D than (e.g., 1.17 tons per day versus 1.27 tons per day, respectively), the small, incremental increase in NOx reductions is not warranted based on the huge costs associated with the installation of the additional SCRs. Therefore, when considering the project in its entirety, the proposed project is more attractive than Alternative D because it achieves more NOx emission reductions with less overall construction and overlapping operational impacts.

Hazards and Hazardous Materials

Alternative A - No Project

Alternative A is not expected to generate significant adverse hazards and hazardous materials impacts primarily because the owners/operators of the affected units would not have to install new or modify existing control equipment (i.e., SCRs and ultra-low NOx burners) whereby no additional NOx emissions would be reduced and no new hazards regarding the handling of hazardous materials would be needed, such as deliveries of aqueous ammonia and fresh catalyst or the disposal of spent catalyst. Further, Alternative A is not expected to alter the deliveries, use and amounts of ammonia and catalyst at the affected facilities. Instead, owners/operators of affected facilities would either continue existing operations that would comply with all applicable SCAQMD, CARB and EPA requirements. By not adopting the proposed project, with respect to hazards and hazardous materials, current operations at each facility would be expected to continue to emit NOx at the levels allowed by the current version of Rule 1146 without impacting the deliveries, quantities, and use (or disposal) of hazardous materials (aqueous ammonia and catalyst).

Alternative B

Alternative B would result in lower NOx emission reductions overall (e.g., 1.0 ton per day) over a longer period of time as the proposed project (e.g., between 2013 and 2018). It is not anticipated that owners/operators of affected facilities would have to install new or modify existing control equipment that would entail the use of hazardous materials such as aqueous ammonia and catalyst (e.g., SCRs). Instead, owners/operators of affected facilities would be able to achieve the additional NOx reductions by merely installing ultra-low NOx burners, which has been previously discussed in this Final ~~Draft~~ EA as not involving hazards or hazardous materials. Therefore, it is not anticipated that the installation of ultra-low NOx burners in accordance with Alternative B would alter the deliveries, use and amounts of ammonia and catalyst at the affected facilities or generate any new significant hazards or hazardous materials impacts.

Alternative C

The main differences between the proposed project and Alternative C are that medium-sized Group II units would also be required to achieve the same five ppm NOx emission limit as Group I units, all in the same year. When compared to the proposed project, Alternative C is expected to require more installations of SCR units, which in turn would include increased hazards and hazardous materials impacts as analyzed for the proposed project. The shortened implementation time will have the effect of compressing the construction hazards impacts relative to the deliveries of catalyst when the SCRs are initially built and the deliveries of aqueous ammonia to initially fill the new storage tanks. Once the construction activities are complete, there will be operational hazards impacts that pertain to deliveries of aqueous ammonia to refill the tanks, the use of ammonia while the SCRs are operating, and the cyclical (i.e., approximately every five years) replacement of spent catalyst with fresh catalyst.

Therefore, it anticipated that the installation of SCR units in accordance with Alternative C will have more impacts when compared to the proposed project because it would increase the number of deliveries, use and amounts of ammonia and catalyst at the affected facilities and as such, would generate significant hazards or hazardous materials impacts.

Alternative D

Even thought the total quantity of proposed NOx emission is slightly more for Alternative D as it is for the proposed project (e.g., 1.27 versus 1.17 tons per day), Alternative D is expected to require more than 10 times the amount of SCR units installed, which includes the same types of hazards and hazardous materials impacts as analyzed for the proposed project. The main difference between the proposed project and Alternative D is that the total number of potentially affected equipment is much higher than the proposed project at 17 SCRs versus 181 SCRs. However, the implementation schedule for Alternative D will be spread out over a larger period of time, 15 years from original installation date of the existing equipment. The types of construction hazards impacts relative to the deliveries of catalyst when the SCRs are initially built and the deliveries of aqueous ammonia to initially fill the new storage tanks will be the same for both the proposed project and Alternative D. However, the amounts will be much higher for Alternative D primarily because more equipment will need SCRs in order to meet the lower NOx emission limits. Once the construction activities are complete, there will be operational hazards impacts, for a larger amount of equipment than for the proposed project, that pertain to deliveries of aqueous ammonia to refill the tanks, the use of ammonia while the SCRs are operating, and the cyclical (i.e., approximately every five years) replacement of spent catalyst with fresh catalyst. Therefore, based on the increased number of affected equipment, it is anticipated that the hazards and hazardous materials impacts associated with the installation of SCR units in accordance with Alternative D is more than the proposed project and would generate significant hazards or hazardous materials impacts.

CONCLUSION

Alternative A provides the least benefit to NOx air quality impacts since no project means no new emission reductions and no equivalency with AQMP or BARCT requirements. Further, pursuant to CEQA Guidelines §15126.6 (e)(2), since Alternative A does not achieve the health benefits of the proposed project, it is not the environmentally superior alternative. Thus, the proposed project is preferred over Alternative A.

With a proposed NOx emissions reduction of 1.0 ton per day, Alternative B does not achieve as much of the health benefits that are expected from the proposed project. However, because Alternative B does not employ the use of SCRs and aqueous ammonia, it is the least toxic alternative when compared to the proposed project. However, Alternative B is not the environmentally superior alternative because it achieves less emission reductions over a longer period of time. Thus, the proposed project is preferred over Alternative B.

With a proposed NOx emissions reduction of 1.29 tons per day, Alternative C will achieve more NOx emission reductions sooner than the proposed project. However, because Alternative C would require SCRs to be installed on a substantial number of medium-sized Group II units, Alternative C is estimated to have more construction and operational impacts for both air quality and hazards and hazardous materials than the proposed project.

The amount of proposed emission reductions from units that would employ SCR technology for Alternative C has a higher likelihood that construction activities will simultaneously occur or

overlap at multiple facilities. Alternative C also has a more compressed compliance timeline than for the proposed project and as such, could potentially result in higher daily construction emissions than would occur with the proposed project over a shorter compliance period.

Similarly, the amount of proposed emission reductions from units that would employ SCR technology for Alternative D has a higher likelihood that construction activities will simultaneously occur or overlap at multiple facilities. Though Alternative D also could have a less compressed compliance timeline than for the proposed project depending on how the distribution of end of life replacements occur in any given year, the hazards and hazardous materials associated with using more SCRs than the proposed project overall, could result in more significant adverse hazards and hazardous materials impacts than would occur for the proposed project.

All things considered, since the Basin is in extreme non-attainment for ozone, for which NOx is a precursor, the proposed project achieves the largest amount of overall NOx reductions by relying on currently available NOx control technologies. Thus, the proposed project is preferred over Alternatives A, B, C, and D because it achieves the best balance between the amount of achievable NOx emission reductions, the peak daily construction impacts and the timeline by which the NOx emissions reductions need to occur.

APPENDIX A (of the Final ~~Draft~~ EA)

PROPOSED AMENDED RULE 1146

In order to save space and avoid repetition, please refer to the latest version of proposed amended Rule 1146 located elsewhere in the Governing Board Package. The draft version of the proposed amended Rule 1146 that was circulated with the Draft EA and released on June 13, 2008 for a 45-day public review and comment period ending July 29, 2008 was "PAR 1146 Draft Rule Language Rev 01."

Original hard copies of the Draft EA, which include the draft version of the proposed amended rule listed above, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-2039.

APPENDIX B

CONSTRUCTION AND OPERATIONS CALCULATIONS

LIST OF WORKSHEETS

Worksheet B-1: SCR Construction for Group I Units in 2012

PAR 1146 Affected Equipment	No. of SCRs	Construction Activity
Group I Unit: Boiler, Steam Generator, or Process Heater	1	Install SCR on Group I unit (rated greater than or equal to 75 mmBTU/hr) during 2012

Construction Schedule - 6 months (130 days, 5 days per week at a maximum of 10 hours per day)

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Crane (120 hp)	1	2	20
	Welding Machines	2	10	
	Air Compressor	1	1	
	Backhoe	1	4	
	Plate Compactor	1	4	
	Forklift	1	3	
	Cement/ Mortar Mixer	1	2	
	Concrete Saw	1	2	
	Generator Set	1	10	
	Aerial Lift (Man lift)	1	2	

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Crane (120 hp)	0.0982	0.3650	0.5844	0.0006	0.0533	50.1000
Welding Machines (composite)	0.0703	0.2150	0.2702	0.0003	0.0243	25.6000
Air Compressor (composite)	0.0984	0.3445	0.6494	0.0007	0.0469	63.6000
Backhoe (composite)	0.0862	0.3824	0.5816	0.0008	0.0435	66.8000
Plate Compactor (composite)	0.0050	0.0263	0.0314	0.0001	0.0013	4.3000
Forklift (composite)	0.0585	0.2257	0.4330	0.0006	0.0231	54.4000
Cement/Mortar Mixer (composite)	0.0093	0.0425	0.0564	0.0001	0.0029	7.2000
Concrete Saw (composite)	0.1090	0.4148	0.5910	0.0007	0.0491	58.5000
Generator Set (composite)	0.0832	0.3121	0.5779	0.0007	0.0351	61.0000
Aerial Lift (composite)	0.0576	0.1976	0.3249	0.0004	0.0219	34.7000

*Equipment is assumed to be diesel fueled.

Construction Vehicle (Mobile Source) Emission Factors for Year 2012	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)	0.00080	0.00765	0.00078	0.00001	0.00009	0.00006	1.10153
Offsite (Flatbed Truck - Heavy-Heavy Duty)	0.00253	0.01022	0.03092	0.00004	0.00150	0.00129	4.21591
Offsite (Delivery Truck - Medium Duty)	0.00224	0.01546	0.01732	0.00003	0.00065	0.00055	2.76628
Onsite (Pickup Truck)	0.00080	0.00765	0.00078	0.00001	0.00009	0.00006	1.10153
Onsite (Watering Truck)	0.00253	0.01022	0.03092	0.00004	0.00150	0.00129	4.21591

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2012

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

Worksheet B-1: SCR Construction for Group I Units in 2012

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	20	25
Offsite (Flatbed Truck)	1	50
Offsite (Delivery Truck - Heavy Duty)	1	50
Onsite (Pickup Truck)	5	2
Onsite (Watering Truck)	3	2

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)

Equipment Type	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	CO2 lb/day
Crane (120 hp)	0.20	0.73	1.17	0.00	0.11	100.20
Welding Machines	1.41	4.30	5.40	0.01	0.49	512.00
Air Compressor	0.10	0.34	0.65	0.00	0.05	63.60
Backhoe	0.34	1.53	2.33	0.00	0.17	267.20
Plate Compactor	0.02	0.11	0.13	0.00	0.01	17.20
Forklift	0.18	0.68	1.30	0.00	0.07	163.20
Cement/Mortar Mixer	0.02	0.09	0.11	0.00	0.01	14.40
Concrete Saw	0.22	0.83	1.18	0.00	0.10	117.00
Generator Set	0.83	3.12	5.78	0.01	0.35	610.00
Aerial Lift (Man lift)	0.12	0.40	0.65	0.00	0.04	69.40
TOTAL	**3.42**	**12.12**	**18.70**	**0.02**	**1.39**	**1934.20**

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)

Vehicle	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	PM2.5 lb/day	CO2 lb/day
Offsite (Construction Worker Vehicle)	0.80	7.65	0.78	0.01	0.09	0.06	1101.53
Offsite (Flatbed Truck - Heavy-Heavy Duty)	0.25	1.02	3.09	0.00	0.15	0.13	421.59
Offsite (Delivery Truck - Heavy Duty)	0.22	1.55	1.73	0.00	0.06	0.05	276.63
Onsite (Pickup Truck)	0.02	0.15	0.02	0.00	0.00	0.00	22.03
Onsite (Watering Truck)	0.03	0.12	0.37	0.00	0.02	0.02	50.59
TOTAL	**1.32**	**10.50**	**5.99**	**0.02**	**0.32**	**0.26**	**1872.37**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2012)

http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

Worksheet B-1: SCR Construction for Group I Units in 2012

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
Group I: Equipment & Workers' Vehicles (1 unit)	**5**	**23**	**25**	**0.04**	**2**	**0.26**	**3807**
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	260	Crane (120 hp)	1.085	282.10	N/A
Operation of Portable Equipment	2600	Welding Machines	1.18	3068.00	N/A
Operation of Portable Equipment	130	Air Compressor	2.904	377.52	N/A
Operation of Portable Equipment	520	Backhoe	3.048	1584.96	N/A
Operation of Portable Equipment	520	Plate Compactor	0.197	102.44	N/A
Operation of Portable Equipment	390	Forklift	2.476	965.64	N/A
Operation of Portable Equipment	260	Cement/Mortar Mixer	0.331	86.06	N/A
Operation of Portable Equipment	260	Concrete Saw	2.68	696.80	N/A
Operation of Portable Equipment	1300	Generator Set	2.781	3615.30	N/A
Operation of Portable Equipment	260	Aerial Lift (Man lift)	1.587	412.62	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	6500.00
Workers' Vehicles - Offsite Delivery/Haul	N/A	Flatbed Truck****	N/A	2658.49	N/A
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	2658.49	N/A
Workers' Vehicles - Onsite Hauling	N/A	Pickup Truck	N/A	N/A	130
Workers' Vehicles - Onsite Hauling	N/A	Watering Truck****	N/A	638.04	N/A
		TOTAL		**17146.45**	**6630.00**

*Assume construction will take approximately 6 months (130 days/yr, 10 hrs/day max).

**Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2012.

***Assume that construction workers' commute vehicles use gasoline and get 20 mi/gal and round trip length is 50 miles.

****Assume that workers' vehicles for offsite hauling use diesel and get 4.89 mi/gal and round trip length is 100 miles.

Worksheet B-2: SCR Construction for Group II Units in 2013

PAR 1146 Affected Equipment	No. of SCRs	Construction Activity
Group II Unit: Boiler, Steam Generator, or Process Heater	1	Install SCR on Group II unit (≤ 20 mmBTU/hr but < 75 mmBTU/hr) during 2013

Construction Schedule - 6 months (130 days, 5 days per week at a maximum of 10 hours per day)

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Crane (120 hp)	1	2	20
	Welding Machines	2	10	
	Air Compressor	1	1	
	Backhoe	1	4	
	Plate Compactor	1	4	
	Forklift	1	3	
	Cement/ Mortar Mixer	1	2	
	Concrete Saw	1	2	
	Generator Set	1	10	
	Aerial Lift (Man lift)	1	2	

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Crane (120 hp)	0.0859	0.3587	0.5189	0.0006	0.0453	50.1
Welding Machines (composite)	0.0589	0.2041	0.2436	0.0003	0.0206	25.6
Air Compressor (composite)	0.0842	0.3313	0.5635	0.0007	0.0396	63.6
Backhoe (composite)	0.0728	0.3747	0.4977	0.0008	0.0341	66.8
Plate Compactor (composite)	0.0050	0.0263	0.0314	0.0001	0.0012	4.3
Forklift (composite)	0.0497	0.2215	0.3551	0.0006	0.0178	54.4
Cement/Mortar Mixer (composite)	0.0089	0.0420	0.0550	0.0001	0.0025	7.2
Concrete Saw (composite)	0.0917	0.4031	0.5267	0.0007	0.0413	58.5
Generator Set (composite)	0.0702	0.2974	0.5083	0.0007	0.0296	61.0
Aerial Lift (composite)	0.0483	0.1877	0.2867	0.0004	0.0184	34.7

*Equipment is assumed to be diesel fueled.

Construction Vehicle (Mobile Source) Emission Factors for Year 2013	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)	0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087
Offsite (Flatbed Truck - Heavy-Heavy Duty)	0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519
Offsite (Delivery Truck - Medium Duty)	0.00206	0.01408	0.01577	0.00003	0.00060	0.00050	2.78163
Onsite (Pickup Truck)	0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087
Onsite (Watering Truck)	0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2013

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

Worksheet B-2: SCR Construction for Group II Units in 2013

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	20	25
Offsite (Flatbed Truck)	1	50
Offsite (Delivery Truck - Heavy Duty)	1	50
Onsite (Pickup Truck)	5	2
Onsite (Watering Truck)	3	2

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)

Equipment Type	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	CO2 lb/day
Crane (120 hp)	0.17	0.72	1.04	0.00	0.09	100.20
Welding Machines	1.18	4.08	4.87	0.01	0.41	512.00
Air Compressor	0.08	0.33	0.56	0.00	0.04	63.60
Backhoe	0.29	1.50	1.99	0.00	0.14	267.20
Plate Compactor	0.02	0.11	0.13	0.00	0.00	17.20
Forklift	0.15	0.66	1.07	0.00	0.05	163.20
Cement/Mortar Mixer	0.02	0.08	0.11	0.00	0.01	14.40
Concrete Saw	0.18	0.81	1.05	0.00	0.08	117.00
Generator Set	0.70	2.97	5.08	0.01	0.30	610.00
Aerial Lift (Man lift)	0.10	0.38	0.57	0.00	0.04	69.40
TOTAL	**2.89**	**11.64**	**16.47**	**0.02**	**1.16**	**1934.20**

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)

Vehicle	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	PM2.5 lb/day	CO2 lb/day
Offsite (Construction Worker Vehicle)	0.75	7.09	0.71	0.01	0.09	0.06	1100.87
Offsite (Flatbed Truck - Heavy-Heavy Duty)	0.23	0.93	2.74	0.00	0.13	0.11	421.52
Offsite (Delivery Truck - Heavy Duty)	0.21	1.41	1.58	0.00	0.06	0.05	278.16
Onsite (Pickup Truck)	0.01	0.14	0.01	0.00	0.00	0.00	22.02
Onsite (Watering Truck)	0.03	0.11	0.33	0.00	0.02	0.01	50.58
TOTAL	**1.22**	**9.69**	**5.38**	**0.02**	**0.30**	**0.24**	**1873.16**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2013)

http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

Total Incremental Combustion Emissions from Construction Activities

	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	PM2.5 lb/day	CO2 lb/day
Group II: Equipment & Workers' Vehicles (1 unit)	**4**	**21**	**22**	**0.04**	**1**	**0.24**	**3807**
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Worksheet B-2: SCR Construction for Group II Units in 2013

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	260	Crane (120 hp)	1.083	281.58	N/A
Operation of Portable Equipment	2600	Welding Machines	1.179	3065.40	N/A
Operation of Portable Equipment	130	Air Compressor	2.902	377.26	N/A
Operation of Portable Equipment	520	Backhoe	3.047	1584.44	N/A
Operation of Portable Equipment	520	Plate Compactor	0.197	102.44	N/A
Operation of Portable Equipment	390	Forklift	2.475	965.25	N/A
Operation of Portable Equipment	260	Cement/Mortar Mixer	0.331	86.06	N/A
Operation of Portable Equipment	260	Concrete Saw	2.678	696.28	N/A
Operation of Portable Equipment	1300	Generator Set	2.78	3614.00	N/A
Operation of Portable Equipment	260	Aerial Lift (Man lift)	1.585	412.10	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	6500.00
Workers' Vehicles - Offsite Delivery/Haul	N/A	Flatbed Truck****	N/A	2658.49	N/A
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	2658.49	N/A
Workers' Vehicles - Onsite Hauling	N/A	Pickup Truck	N/A	N/A	130
Workers' Vehicles - Onsite Hauling	N/A	Watering Truck****	N/A	638.04	N/A
			TOTAL	**17139.82**	**6630.00**

*Assume construction will take approximately 6 months (130 days/yr, 10 hrs/day max).

**Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2013.

***Assume that construction workers' commute vehicles use gasoline and get 20 mi/gal and round trip length is 50 miles.

****Assume that workers' vehicles for offsite hauling use diesel and get 4.89 mi/gal and round trip length is 100 miles.

Worksheet B-3: Alternative C - SCR Construction for Group I Units in 2011

Alternative C: Same limits as PAR 1146 but with construction occurring in 2011

PAR 1146 Affected Equipment	No. of SCRs	Construction Activity
Group I Unit: Boiler, Steam Generator, or Process Heater	1	Install SCR on Group I unit (rated greater than or equal to 75 mmBTU/hr) during 2011

Construction Schedule - 6 months (130 days, 5 days per week at a maximum of 10 hours per day)

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Crane (120 hp)	1	2	20
	Welding Machines	2	10	
	Air Compressor	1	1	
	Backhoe	1	4	
	Plate Compactor	1	4	
	Forklift	1	3	
	Cement/ Mortar Mixer	1	2	
	Concrete Saw	1	2	
	Generator Set	1	10	
	Aerial Lift (Man lift)	1	2	

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Crane (120 hp)	0.1048	0.3686	0.6196	0.0006	0.0571	50.1000
Welding Machines (composite)	0.0758	0.2203	0.2818	0.0003	0.0258	25.6000
Air Compressor (composite)	0.1054	0.3524	0.6923	0.0007	0.0501	63.6000
Backhoe (composite)	0.0938	0.3874	0.6276	0.0008	0.0482	66.8000
Plate Compactor (composite)	0.0050	0.0263	0.0315	0.0001	0.0013	4.3000
Forklift (composite)	0.0635	0.2284	0.4742	0.0006	0.0257	54.4000
Cement/Mortar Mixer (composite)	0.0096	0.0429	0.0575	0.0001	0.0032	7.2000
Concrete Saw (composite)	0.1179	0.4209	0.6240	0.0007	0.0525	58.5000
Generator Set (composite)	0.0898	0.3204	0.6121	0.0007	0.0376	61.0000
Aerial Lift (composite)	0.0624	0.2033	0.3429	0.0004	0.0235	34.7000

*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)	0.00085	0.00826	0.00084	0.00001	0.00009	0.00006	1.10235
Offsite (Flatbed Truck - Heavy-Heavy Dut	0.00280	0.01112	0.03456	0.00004	0.00166	0.00144	4.22046
Offsite (Delivery Truck - Medium Duty)	0.00242	0.01693	0.01893	0.00003	0.00070	0.00060	2.75181
Onsite (Pickup Truck)	0.00085	0.00826	0.00084	0.00001	0.00009	0.00006	1.10235
Onsite (Watering Truck)	0.00280	0.01112	0.03456	0.00004	0.00166	0.00144	4.22046

Worksheet B-3: Alternative C - SCR Construction for Group I Units in 2011

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2011

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	20	25
Offsite (Flatbed Truck)	1	50
Offsite (Delivery Truck - Heavy Duty)	1	50
Onsite (Pickup Truck)	5	2
Onsite (Watering Truck)	3	2

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)

Equipment Type	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	CO2 lb/day
Crane (120 hp)	0.21	0.74	1.24	0.00	0.11	100.20
Welding Machines	1.52	4.41	5.64	0.01	0.52	512.00
Air Compressor	0.11	0.35	0.69	0.00	0.05	63.60
Backhoe	0.38	1.55	2.51	0.00	0.19	267.20
Plate Compactor	0.02	0.11	0.13	0.00	0.01	17.20
Forklift	0.19	0.69	1.42	0.00	0.08	163.20
Cement/Mortar Mixer	0.02	0.09	0.12	0.00	0.01	14.40
Concrete Saw	0.24	0.84	1.25	0.00	0.11	117.00
Generator Set	0.90	3.20	6.12	0.01	0.38	610.00
Aerial Lift (Man lift)	0.12	0.41	0.69	0.00	0.05	69.40
TOTAL	**3.69**	**12.37**	**19.80**	**0.02**	**1.49**	**1934.20**

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)

Vehicle	VOC lb/day	CO lb/day	NOx lb/day	SOx lb/day	PM10 lb/day	PM2.5 lb/day	CO2 lb/day
Offsite (Construction Worker Vehicle)	0.85	8.26	0.84	0.01	0.09	0.06	1102.35
Offsite (Flatbed Truck - Heavy-Heavy Dut	0.28	1.11	3.46	0.00	0.17	0.14	422.05
Offsite (Delivery Truck - Heavy Duty)	0.24	1.69	1.89	0.00	0.07	0.06	275.18
Onsite (Pickup Truck)	0.02	0.17	0.02	0.00	0.00	0.00	22.05
Onsite (Watering Truck)	0.03	0.13	0.41	0.00	0.02	0.02	50.65
TOTAL	**1.42**	**11.37**	**6.63**	**0.02**	**0.35**	**0.28**	**1872.27**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2011)

http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

Worksheet B-3: Alternative C - SCR Construction for Group I Units in 2011

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
Group I: Equipment & Workers' Vehicles (1 unit)	**5**	**24**	**26**	**0.04**	**2**	**0.28**	**3806**
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	260	Crane (120 hp)	1.087	282.62	N/A
Operation of Portable Equipment	2600	Welding Machines	1.182	3073.20	N/A
Operation of Portable Equipment	130	Air Compressor	2.906	377.78	N/A
Operation of Portable Equipment	520	Backhoe	3.05	1586.00	N/A
Operation of Portable Equipment	520	Plate Compactor	0.197	102.44	N/A
Operation of Portable Equipment	390	Forklift	2.477	966.03	N/A
Operation of Portable Equipment	260	Cement/Mortar Mixer	0.331	86.06	N/A
Operation of Portable Equipment	260	Concrete Saw	2.682	697.32	N/A
Operation of Portable Equipment	1300	Generator Set	2.783	3617.90	N/A
Operation of Portable Equipment	260	Aerial Lift (Man lift)	1.588	412.88	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	6500.00
Workers' Vehicles - Offsite Delivery/Haul	N/A	Flatbed Truck****	N/A	2658.49	N/A
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	2658.49	N/A
Workers' Vehicles - Onsite Hauling	N/A	Pickup Truck	N/A	N/A	130
Workers' Vehicles - Onsite Hauling	N/A	Watering Truck****	N/A	638.04	N/A
			TOTAL	**17157.24**	**6630.00**

*Assume construction will take approximately 6 months (130 days/yr, 10 hrs/day max).

**Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2011.

***Assume that construction workers' commute vehicles use gasoline and get 20 mi/gal and round trip length is 50 miles.

****Assume that workers' vehicles for offsite hauling use diesel and get 4.89 mi/gal and round trip length is 100 miles.

Worksheet B-4: Fugitive Dust From Ammonia Tank Construction for Groups I and II

Fugitive PM10 Emissions Associated with Ammonia Tank Installation for SCR Retrofit (due to building containment berm)

1. GRADING ACTIVITIES (Backhoe)

G = Fugitive PM10 Emission Rate (lbs/day) = 0.75 x T x 1.0 x (S)1.5 x (M)-1.4 *Source: AP-42, 10/98, Table 11.9-1 (PM10 Equation for Overburden Bulldozing)*

S = Silt Content	6.9	*Source: AP-42, 10/98, Table 11.9-3 (Correction Factors for Overburden Bulldozing)*
M = Moisture Content	7.9	*Source: AP-42, 10/98, Table 11.9-3 (Correction Factors for Overburden Bulldozing)*
T = max hours of operation/day	8	
G = Fugitive PM10 =	**6.02 lbs/day**	

2. TRENCHING/STOCKPILE LOADING (Backhoe)

LPM10 = Emission Factor per particle size (lbs/ton) = kPM10(0.0032) x (U/5)1.3x(M/2)-1.4 *Source: AP-42, 01/95, p. 13.2.4-3 (Equation 1 for English Units)*

			Sources:
U = Mean Wind Speed	5.139	mile/hr	*AP-42, 10/98, Table 11.9-5 (See Mine I)*
M = Material Moisture Content	7.9	%	*AP-42, 10/98, Table 11.9-3 (Overburden Bulldozing)*
kPM10 = Particle Size Multiplier for PM10	0.35	dimensionless	*AP-42, 01/95, p. 13.2.4-3*
G = Maximum Daily Weight of Material Moved	10	tons/day	
Tday, t = Truck Operating time, maximum	10	hr/day	

LPM10 = Emission Factor per particle size =	LPM10 =	0.00016961	lbs PM10/ton soil moved
PPM10 = Emission Rate based on particle size = (LPMx G) =	**PPM10 =**	**0.00169615**	**lbs PM10/day**

3. STOCKPILE WIND EROSION

Q = Wind Erosion Emission Rate based on particle size (lbs/day) = kPM10* 0.72 x U x Tc * (A x B /43,560 sq. ft/acre)
Source: AP-42, 10/98, Table 11.9-1 (Emission Factor Equation for Active Storage Pile)

A = Length of Stockpile	15	ft	
B = Width of Stockpile	15	ft	*Sources:*
U = Mean Wind Speed	5.139	mile/hr	*AP-42, 10/98, Table 11.9-5 (General Characteristics of Surface Coal Mines - Mine I)*
kPM10 = Particle Size Multiplier for PM10	0.5	dimensionless	*AP-42, 01/95, p. 13.2.5-3 (PM10 Aerodynamic Particle Size Multiplier (k) for Equation 2)*
Tc = Time Piles Remain Uncovered	24	hr/day	Note: This calculation assumes that the piles remain uncovered for 24 hours/day.

QPM10 = 0.2293438 lbs PM10/day

4. TRUCK FILLING/DUMPING

TF = Fugitive PM10 Emissions From Truck Filling = G (ton/day) x TF, PM10 (lb/ton)
TD = Fugitive PM10 Emissions From Truck Filling = G (ton/day) x TD, PM10 (lb/ton)

TFPM10 = Emission Factor for Truck Filling =	0.02205	lb/ton of material moved
TDPM10 = Emission Factor for Truck Dumping =	0.009075	lb/ton of material moved
G = Maximum Daily Weight of Material Trucked Away	10	ton/day

TF = 0.2205 lbs PM10/day
TD = 0.09075 lbs PM10/day

FUGITIVE PM10 EMISSIONS SUMMARY

Section No.	**Activity**	**Unmitigated PM10 (lbs/day)**	**Mitigated PM10* (lbs/day)**
1	Grading	6.02	2.35
2	Trenching/Stockpile Loading	0.00	0.00
3	Storage Piles - Wind Erosion	0.23	0.09
4	Truck Filling/Dumping	0.31	0.12
	TOTAL	**6.56**	**2.56**

*Water three times per day per SCAQMD Rule 403 (61 % control efficiency)

Worksheet B-5: Estimated Aqueous Ammonia Need and Tank Sizing for Group I Units

Estimated Ammonia Use & Ammonia Tank Sizing for Group I units

Compound	Chemical Formula	% in Solution	Molecular Weight (MW)	Number of Moles (%/MW)	Mole Fraction	Total weight needed (lbs) at 90% Control Efficiency	Total weight needed (lbs) at 70% Control Efficiency*	RMP limit for NH3 (lbs)
Aqueous Ammonia	NH3	19	17	1.12	0.20	148.57	150.04	500
Water	H20	81	18	4.5	0.80	781.92	789.70	2631.58
	total	100		5.62	1	930.49	939.75	3131.58

*Worst-case would be at 70% CE.

Assumptions:	Outlet Limit (ppm)	Inlet NOx (ppm)	Control Efficiency (CE)
NOx	5	16.67	0.70
Ammonia Slip (NH3)	5	50.00	0.90
1 mole NOx to 1.05 mole NH3			

	tons/day	lbs/day
8 Group II units estimated NOx reduction at 55% load	**0.16**	**320**
8 Group II units estimated NOx reduction at 70% load	**0.2**	**400**

*Worst-case would be at 70% load.

Compound	Chemical Formula	Molecular Weight (MW)	8 Group I units estimated NOx reduction (lbs/day) at 70% load	Moles of NOx reduced (lb/day / MW)	Minimum NH3 needed to reduce NOx (lb/day)	Stoichiometric Ratio (moles)	Excess NH3 needed @70% CE (lb/day)	Excess NH3 needed @90% CE (lb/day)
NOx	NO2	46	400	8.70	147.83	1	n/a	
Aqueous Ammonia	NH3	17				1.05	1.50%	0.50%
							150.04 (total includes excess NH3)	148.57 (total includes excess NH3)

Density of NH3 solution at 68 deg. F (lb/gal)	7.7		Gallons NH3 needed to operate one SCR unit per day	Gallons NH3 needed to operate one SCR unit per year	Gallons NH3 needed to operate one SCR unit per month	NH3 Tank Capacity (gallons) for 1 month deliveries	NH3 Tank Capacity (gallons) for bi-weekly deliveries or space limitations
gallons/day of NH3 solution 19% @ 70% CE	122.04	for 8 units	15.26	5568.30	464.03	500	250
gallons/day of NH3 solution 19% @ 90% CE	120.84	for 8 units	15.11	5513.44	459.45	500	250

Worksheet B-6: Estimated Aqueous Ammonia Need and Tank Sizing for Group II Units

Estimated Ammonia Use & Ammonia Tank Sizing for Group II units

Compound	Chemical Formula	% in Solution	Molecular Weight (MW)	Number of Moles (%/MW)	Mole Fraction	Total weight needed (lbs) at 90% Control Efficiency	Total weight needed (lbs) at 70% Control Efficiency*	RMP limit for NH3 (lbs)
Aqueous Ammonia	NH3	19	17	1.12	0.20	23.17	23.40	500
Water	H20	81	18	4.5	0.80	121.92	123.13	2631.58
	total	100		5.62	1	145.09	146.53	3131.58

*Worst-case would be at 70% CE.

Assumptions:	Outlet Limit (ppm)	Inlet NOx (ppm)	Control Efficiency (CE)
NOx	5	16.67	0.70
Ammonia Slip (NH3)	5	50.00	0.90
1 mole NOx to 1.05 mole NH3			

	tons/day	lbs/day	
9 Group II units estimated NOx reduction at 30% load	**0.011695**	**23.39**	
9 Group II units estimated NOx reduction at 70% load	**0.031185**	**62.37**	*Worst-case would be at 70% load.

Compound	Chemical Formula	Molecular Weight (MW)	9 Group II units estimated NOx reduction (lbs/day) at 70% load	Moles of NOx reduced (lb/day / MW)	Minimum NH3 needed to reduce NOx (lb/day)	Stoichiometric Ratio (moles)	Excess NH3 needed @70% CE (lb/day)	Excess NH3 needed @90% CE (lb/day)
NOx	NO2	46	62.37	1.36	23.05	1	n/a	
aqueous ammonia	NH3	17				1.05	1.50% 23.40 (total includes excess NH3)	0.50% 23.17 (total includes excess NH3)

Density of NH3 solution at 68 deg. F (lb/gal)	7.7		Gallons NH3 needed to operate one SCR unit per day	Gallons NH3 needed to operate one SCR unit per year	Gallons NH3 needed to operate one SCR unit per month	NH3 Tank Capacity (gallons) for 1 month deliveries
gallons/day of NH3 solution 19% @ 70% CE	19.03	for 9 units	2.11	771.77	64.31	100
gallons/day of NH3 solution 19% @ 90% CE	18.84	for 9 units	2.09	764.16	63.68	100

Worksheet B-7: Alternative C - Estimated Aqueous Ammonia Need and Tank Sizing for Group II Units

Estimated Ammonia Use & Ammonia Tank Sizing for Group II units under Alternative C

Compound	Chemical Formula	% in Solution	Molecular Weight (MW)	Number of Moles (%/MW)	Mole Fraction	Total weight needed (lbs) at 90% Control Efficiency	Total weight needed (lbs) at 70% Control Efficiency*	RMP limit for NH3 (lbs)
aqueous ammonia	NH3	19	17	1.12	0.20	1121.67	1132.83	500
water	H20	81	18	4.5	0.80	5903.51	5962.25	2631.58
	total	100		5.62	1	7025.18	7095.08	3131.58

*Worst-case would be at 70% CE.

Assumptions:	Outlet Limit (ppm)	Inlet NOx (ppm)	Control Efficiency (CE)
NOx	5	16.67	0.70
Ammonia Slip (NH3)	5	50.00	0.90
1 mole NOx to 1.05 mole NH3			

	tons/day	lbs/day	
173 Group II units estimated NOx reduction at 30% load	**0.65**	**1300**	
173 Group II units estimated NOx reduction at 70% load	**1.51**	**3020**	*Worst-case would be at 70% load.

Compound	Chemical Formula	Molecular Weight (MW)	173 Group II units estimated NOx reduction (lbs/day) at 70% load	Moles of NOx reduced (lb/day / MW)	Minimum NH3 needed to reduce NOx (lb/day)	Stoichiometric Ratio (moles)	Excess NH3 needed @70% CE (lb/day)	Excess NH3 needed @90% CE (lb/day)
NOx	NO2	46	3020	65.65	1116.09	1	n/a	
aqueous ammonia	NH3	17				1.05	1.50%	0.50%
							1132.83 (total includes excess NH3)	1121.67 (total includes excess NH3)

			Gallons NH3 needed to operate one SCR unit per day	Gallons NH3 needed to operate one SCR unit per year	Gallons NH3 needed to operate one SCR unit per month	NH3 Tank Capacity (gallons) for 1 month deliveries
Density of NH3 solution at 68 deg. F (lb/gal)	**7.7**					
gallons/day of NH3 solution 19% @ 70% CE	921.44	for 173 units	5.33	1944.08	162.01	200
gallons/day of NH3 solution 19% @ 90% CE	912.36	for 173 units	5.27	1924.92	160.41	200

Worksheet B-8: SCR Operation of Group I Units

Operational Emissions Associated with Ammonia Tank Filling & Catalyst Deliveries for SCRs on Group I Units

	No. of SCR	Operation Activity
Affected Facilities with SCR Retrofits	1	Operation/Maintenance of SCR + One Ammonia Tank

Operation Schedule 365 days/yr - 24 hours/day
Catalyst Replacement Schedule: Approximately once every 5 years
Ammonia Delivery Schedule: Truck deliveries can deliver up to 7,000 gallons per truck.
Assume NH3 usage of ~ 15 gal/day or 465 gal/month. Tank size would be 500 gallon capacity, filled once per month or 250 gallons filled bi-weekly.

Operation Vehicle (Mobile Source) Emission Factors

Operation Related Activity	**VOC** lb/mile	**CO** lb/mile	**NOx** lb/mile	**SOx** lb/mile	**PM10** lb/mile	**PM2.5** lb/mile	**CO2** lb/mile
Offsite (Truck Delivery of Spent Catalyst Modules)	0.00253	0.01022	0.03092	0.00004	0.00150	0.00129	4.21591
Offsite (Truck Delivery of Fresh Catalyst)	0.00253	0.01022	0.03092	0.00004	0.00150	0.00129	4.21591
Offsite (Truck Delivery of Aqueous Ammonia)	0.00253	0.01022	0.03092	0.00004	0.00150	0.00129	4.21591

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2012)
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)	Frequency
Offsite (Truck Delivery of Spent Catalyst)	2	50	Once every 5 years
Offsite (Truck Delivery of Fresh Catalyst)	2	50	When first built, then once every 5 years
Offsite (Truck Delivery of Aqueous Ammonia)	2	50	When tank initially filled, then monthly or bi-weekly, depending on tank size

Incremental Increase in Offsite Combustion Emissions from Transport or Delivery Vehicles
Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Transport/Delivery Emissions (lbs/day)

Once Every Five Years	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery to Remove Spent Catalyst)	0.51	2.04	6.18	0.01	0.30	0.26	843.18
Offsite (Truck Delivery to Deliver Fresh Catalyst)	0.51	2.04	6.18	0.01	0.30	0.26	843.18
Offsite (Truck Delivery of Aqueous Ammonia)	0.51	2.04	6.18	0.01	0.30	0.26	843.18
Total	**2**	**6**	**19**	**0**	**1**	**1**	**2530**

Initial Set-up of SCR	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery to Deliver Fresh Catalyst)	0.51	2.04	6.18	0.01	0.30	0.26	843.18
Offsite (Truck Delivery of Aqueous Ammonia)	0.51	2.04	6.18	0.01	0.30	0.26	843.18
Total	**1**	**4**	**12**	**0**	**1**	**1**	**1686**

Regular Delivery of Aqueous Ammonia	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery of Aqueous Ammonia)	**1**	**4**	**12**	**0**	**1**	**1**	**1686**

*Assumes 2 tanks filled in any one week

Worksheet B-8: SCR Operation of Group I Units

Total Incremental Combustion Emissions from Operation Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Sources	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Offsite Vehicles	2	6	19	0	1	1	2530
Significant Threshold	55	550	55	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Offsite Vehicles

Operation Activity	Total Hours of Operation	Equipment Type	Rating (hp)	Diesel Fuel Usage (gal/yr)*	Gasoline Fuel Usage (gal/yr)
Workers' Vehicles - Offsite Hauling	N/A	Delivery Truc	N/A	6380.37	N/A
			Total	6380.37	N/A

*Assume that workers' vehicles for offsite hauling occurs once a week and use diesel and get 4.89 mi/gal and round trip length is 100 miles.

Worksheet B-9: SCR Operation of Group II Units

Operational Emissions Associated with Ammonia Tank Filling & Catalyst Deliveries for SCRs on Group II Units

	No. of SCR	Operation Activity
Affected Facilities with SCR Retrofits	1	Operation/Maintenance of SCR + One Ammonia Tank

Operation Schedule 365 days/yr - 24 hours/day
Catalyst Replacement Schedule: Approximately once every 5 years
Ammonia Delivery Schedule: Truck deliveries can deliver up to 7,000 gallons per truck.
Assume NH3 usage of ~ 3 gal/day or 75 gal/month. Tank size would be 100 gallon capacity, filled once per month or 50 gallons, filled bi-weekly.

Operation Vehicle (Mobile Source) Emission Factors

Operation Related Activity	**VOC** lb/mile	**CO** lb/mile	**NOx** lb/mile	**SOx** lb/mile	**PM10** lb/mile	**PM2.5** lb/mile	**CO2** lb/mile
Offsite (Truck Delivery of Spent Catalyst Modules)	0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519
Offsite (Truck Delivery of Fresh Catalyst)	0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519
Offsite (Truck Delivery of Aqueous Ammonia)	0.00226	0.00932	0.02743	0.00004	0.00134	0.00115	4.21519

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2013
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)	Frequency
Offsite (Truck Delivery of Spent Catalyst)	2	50	Once every 5 years
Offsite (Truck Delivery of Fresh Catalyst)	2	50	When first built, then once every 5 years
Offsite (Truck Delivery of Aqueous Ammonia)	2	50	When tank initially filled, then monthly or bi-weekly, depending on tank size

Incremental Increase in Offsite Combustion Emissions from Transport or Delivery Vehicles
Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Transport/Delivery Emissions (lbs/day)

Once Every Five Years	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery to Remove Spent Catalyst)	0.45	1.86	5.49	0.01	0.27	0.23	843.04
Offsite (Truck Delivery to Deliver Fresh Catalyst)	0.45	1.86	5.49	0.01	0.27	0.23	843.04
Offsite (Truck Delivery of Aqueous Ammonia)	0.45	1.86	5.49	0.01	0.27	0.23	843.04
Total	**1**	**6**	**16**	**0**	**1**	**1**	**2529**

Initial Set-up of SCR	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery to Deliver Fresh Catalyst)	0.45	1.86	5.49	0.01	0.27	0.23	843.04
Offsite (Truck Delivery of Aqueous Ammonia)	0.45	1.86	5.49	0.01	0.27	0.23	843.04
Total	**1**	**4**	**11**	**0**	**1**	**0**	**1686**

Regular Delivery of Aqueous Ammonia	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery of Aqueous Ammonia)	**1**	**4**	**11**	**0**	**1**	**0**	**1686**

*Assumes 2 tanks filled in any one week

Worksheet B-9: SCR Operation of Group II Units

Total Incremental Combustion Emissions from Operation Activities

Sources	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite Vehicles	**1**	**6**	**16**	**0**	**1**	**1**	**2529**
Significant Threshold	55	550	55	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Offsite Vehicles

Operation Activity	Total Hours of Operation	Equipment Type Delivery	Rating (hp)	Diesel Fuel Usage (gal/yr)*	Gasoline Fuel Usage (gal/yr)
Workers' Vehicles - Offsite Hauling	N/A	Truck	N/A	6380.37	N/A
			Total	6380.37	N/A

*Assume that workers' vehicles for offsite hauling occurs once a week and use diesel and get 4.89 mi/gal and round trip length is 100 miles.

Worksheet B-10: Alternative C - SCR Operation of Group I Units

Alternative C: Operational Emissions Associated with Ammonia Tank Filling & Catalyst Deliveries for SCRs on Group I Units in Year 2011

	No. of SCR	Operation Activity
Affected Facilities with SCR Retrofits	1	Operation/Maintenance of SCR + One Ammonia Tank

Operation Schedule 365 days/yr - 24 hours/day
Catalyst Replacement Schedule: Approximately once every 5 years
Ammonia Delivery Schedule: Truck deliveries can deliver up to 7,000 gallons per truck.
Assume NH3 usage of ~ 12 gal/day or 375 gal/month. Tank size would be 500 gallon capacity, filled once per month or 250 gallons filled bi-weekly.

Operation Vehicle (Mobile Source) Emission Factors

Operation Related Activity	**VOC** lb/mile	**CO** lb/mile	**NOx** lb/mile	**SOx** lb/mile	**PM10** lb/mile	**PM2.5** lb/mile	**CO2** lb/mile
Offsite (Truck Delivery of Spent Catalyst Modules)	0.00280	0.01112	0.03456	0.00004	0.00166	0.00144	4.22046
Offsite (Truck Delivery of Fresh Catalyst)	0.00280	0.01112	0.03456	0.00004	0.00166	0.00144	4.22046
Offsite (Truck Delivery of Aqueous Ammonia)	0.00280	0.01112	0.03456	0.00004	0.00166	0.00144	4.22046

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2011)
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)	Frequency
Offsite (Truck Delivery of Spent Catalyst)	2	50	Once every 5 years
Offsite (Truck Delivery of Fresh Catalyst)	2	50	When first built, then once every 5 years
Offsite (Truck Delivery of Aqueous Ammonia)	2	50	When tank initially filled, then monthly or bi-weekly, depending on tank size

Incremental Increase in Offsite Combustion Emissions from Transport or Delivery Vehicles
Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Transport/Delivery Emissions (lbs/day)

Once Every Five Years	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery to Remove Spent Catalyst)	0.56	2.22	6.91	0.01	0.33	0.29	844.09
Offsite (Truck Delivery to Deliver Fresh Catalyst)	0.56	2.22	6.91	0.01	0.33	0.29	844.09
Offsite (Truck Delivery of Aqueous Ammonia)	0.56	2.22	6.91	0.01	0.33	0.29	844.09
Total	**2**	**7**	**21**	**0**	**1**	**1**	**2532**

Initial Set-up of SCR	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery to Deliver Fresh Catalyst)	0.56	2.22	6.91	0.01	0.33	0.29	844.09
Offsite (Truck Delivery of Aqueous Ammonia)	0.56	2.22	6.91	0.01	0.33	0.29	844.09
Total	**1**	**4**	**14**	**0**	**1**	**1**	**1688**

Regular Delivery of Aqueous Ammonia	**VOC** lbs/day	**CO** lbs/day	**NOx** lbs/day	**SOx** lbs/day	**PM10** lbs/day	**PM2.5** lbs/day	**CO2** lbs/day
Offsite (Truck Delivery of Aqueous Ammonia)	**1**	**4**	**14**	**0**	**1**	**1**	**1688**

*Assumes 2 tanks filled in any one week

Worksheet B-10: Alternative C - SCR Operation of Group I Units

Total Incremental Combustion Emissions from Operation Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Sources	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Offsite Vehicles	**2**	**7**	**21**	**0**	**1**	**1**	**2532**
Significant Threshold	55	550	55	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Offsite Vehicles

Operation Activity	Total Hours of Operation	Equipment Type	Rating (hp)	Diesel Fuel Usage (gal/yr)*	Gasoline Fuel Usage (gal/yr)
Workers' Vehicles - Offsite Hauling	N/A	Delivery Truck	N/A	6380.37	N/A
			Total	6380.37	N/A

*Assume that workers' vehicles for offsite hauling occurs once a week and use diesel and get 4.89 mi/gal and round trip length is 100 miles.

Worksheet B-11: Summary for Group I Units

Group I Units: 8 ammonia tanks for 8 SCRs built in Year 2012

Peak Construction	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CO2 lbs/year	CO2 metric tons/year
PHASE 1a: Fugitive Dust Emissions Associated with Installing Berms for 1 SCR Ammonia Storage Tank* *Reflects 61% mitigation due to watering	**0**	**0**	**0**	**0**	**2.56**	**0.54**	**0**	0	0
PHASE 1b: Install 1 SCR on 1 Group I Unit									
Combustion Equipment	3.42	12.12	18.70	0.02	1.39	0.00	1934.20	251446.00	114.03
Vehicles	1.32	10.50	5.99	0.02	0.32	0.26	1872.37	243407.58	110.39
PHASE 1b SUBTOTAL for 1 SCR	**4.74**	**22.61**	**24.68**	**0.04**	**1.71**	**0.26**	**3806.57**	**494853.58**	**224.42**
PHASE 2: Deliver Catalyst & Initially Fill NH3 tank									
Delivery Vehicle - Fresh Catalyst	0.51	2.04	6.18	0.01	0.30	0.26	843.18	843.18	0.38
Delivery Vehicle - NH3	0.51	2.04	6.18	0.01	0.30	0.26	843.18	843.18	0.38
PHASE 2 SUBTOTAL for 1 SCR	**1.01**	**4.09**	**12.37**	**0.02**	**0.60**	**0.52**	**1686.36**	**1686.36**	**0.76**
TOTAL for 1 SCR	**6**	**27**	**37**	**0**	**5**	**1**	**5493**	**496540**	**225**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 2 SCRs (25% overlap)	**12**	**53**	**74**	**0**	**10**	**3**	**10986**	**993080**	**450**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 4 SCRs (50% overlap)	**23**	**107**	**148**	**0**	**19**	**5**	**21972**	**1986160**	**901**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a
TOTAL for 6 SCRs (75% overlap)	**35**	**160**	**222**	**0**	**29**	**8**	**32958**	**2979240**	**1351**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a
TOTAL for 8 SCRs	**46**	**214**	**296**	**0**	**39**	**11**	**43943**	**3972320**	**1802**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a

Worksheet B-11: Summary for Group I Units

Peak Operation	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CO2	CO2
Once Every Five Years	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/year	metric tons/year
Delivery Vehicles - Removing Spent Catalyst	0.51	2.04	6.18	0.01	0.30	0.26	843.18	843.18	0.38
Delivery Vehicles - Fresh Catalyst	0.51	2.04	6.18	0.01	0.30	0.26	843.18	843.18	0.38
Subtotal	1.01	4.09	12.37	0.02	0.60	0.52	1686.36	1686.36	0.76
Once Per Month									
Delivery Vehicles - NH3 for 1 SCR	0.51	2.04	6.18	0.01	0.30	0.26	843.18	10118.18	4.59
Delivery Vehicles - NH3 for 8 SCRs - annual only								80945.43	**36.71**
TOTAL for 1 SCR	**2**	**6**	**19**	**0**	**1**	**1**	**2530**	**11805**	**5**
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 2 SCRs (overlap)	**3**	**12**	**37**	**0**	**2**	**2**	**5059**		
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a		
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a		

Worksheet B-12: Summary for Group II Units

Group II Units: 9 ammonia tanks for 9 SCRs built in Year 2013

Peak Construction	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CO2 lbs/year	CO2 metric tons/year
PHASE 1a: Fugitive Dust Emissions Associated with Installing Berm for 1 SCR Ammonia Storage Tank*	**0**	**0**	**0**	**0**	**2.56**	**0.54**	**0**	0	0
*Reflects 61% mitigation due to watering									
PHASE 1b: Install 1 SCR on 1 Group II Unit									
Combustion Equipment	2.89	11.64	16.47	0.02	1.16	0.00	1934.20	251446.00	114.03
Vehicles	1.22	9.69	5.38	0.02	0.30	0.24	1873.16	243510.29	110.44
PHASE 1b SUBTOTAL for 1 SCR	**4.11**	**21.32**	**21.85**	**0.04**	**1.46**	**0.24**	**3807.36**	**494956.29**	**224.47**
PHASE 2: Deliver Catalyst & Initially Fill NH3 tank									
Delivery Vehicle - Fresh Catalyst	0.45	1.86	5.49	0.01	0.27	0.23	843.04	843.04	0.38
Delivery Vehicle - NH3	0.45	1.86	5.49	0.01	0.27	0.23	843.04	843.04	0.38
PHASE 2 SUBTOTAL for 1 SCR	**0.91**	**3.73**	**10.97**	**0.02**	**0.53**	**0.46**	**1686.07**	**1686.07**	**0.76**
TOTAL for 1 SCR	**5**	**25**	**33**	**0**	**5**	**1**	**5493**	**496642**	**225**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 2 SCRs (25% overlap)	**10**	**50**	**66**	**0**	**9**	**2**	**10987**	**993285**	**450**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 5 SCRs (50% overlap)	**25**	**125**	**164**	**0**	**23**	**6**	**27467**	**2483212**	**1126**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a
TOTAL for 7 SCRs (75% overlap)	**35**	**175**	**230**	**0**	**32**	**9**	**38454**	**3476497**	**1577**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a
TOTAL for 9 SCRs	**45**	**225**	**295**	**1**	**41**	**11**	**49441**	**4469781**	**2027**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a

Worksheet B-12: Summary for Group II Units

Peak Operation Once Every Five Years	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CO2 lbs/year	CO2 metric tons/year
Delivery Vehicle - Removing Spent Catalyst	0.45	1.86	5.49	0.01	0.27	0.23	843.04	843.04	0.38
Delivery Vehicle - Fresh Catalyst	0.45	1.86	5.49	0.01	0.27	0.23	843.04	843.04	0.38
Subtotal	0.91	3.73	10.97	0.02	0.53	0.46	1686.07	1686.07	0.76
Once Per Month									
Delivery Vehicles - NH3 for 1 SCR	0.45	1.86	5.49	0.01	0.27	0.23	843.04	10116.45	4.59
Delivery Vehicles - NH3 for 9 SCRs - annual only								91048.01	41.29
TOTAL for 1 SCR	**1**	**6**	**16**	**0**	**1**	**1**	**2529**	**11803**	**5**
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 2 SCRs (overlap)	**3**	**11**	**33**	**0**	**2**	**1**	**5058**		
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a		
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a		

Worksheet B-13: Alternative C - Summary for Group I Units

Alternative C: Group I Units: 8 ammonia tanks for 8 SCRs built in Year 2011

Peak Construction	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CO2 lbs/year	CO2 metric tons/year
PHASE 1a: Fugitive Dust Emissions Associated with Installing Berms for 1 SCR Ammonia Storage Tank*	**0**	**0**	**0**	**0**	**2.56**	**0.54**	**0**	0	0
*Reflects 61% mitigation due to watering									
PHASE 1b: Install 1 SCR on 1 Group I Unit									
Combustion Equipment	3.69	12.37	19.80	0.02	1.49	0	1934.20	251446.00	114.03
Vehicles	1.42	11.37	6.63	0.02	0.35	0.28	1872.27	243395.17	110.38
PHASE 1b SUBTOTAL for 1 SCR	**5.12**	**23.74**	**26.42**	**0.04**	**1.84**	**0.28**	**3806.47**	**494841.17**	**224.42**
PHASE 2: Deliver Catalyst & Initially Fill NH3 tank									
Delivery Vehicle - Fresh Catalyst	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
Delivery Vehicle - NH3	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
PHASE 2 SUBTOTAL for 1 SCR	**1.12**	**4.45**	**13.82**	**0.02**	**0.66**	**0.58**	**1688.18**	**1688.18**	**0.77**
TOTAL for 1 SCR	**6**	**28**	**40**	**0**	**5**	**1**	**5495**	**496529**	**225**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 2 SCRs (25% overlap)	**12**	**56**	**80**	**0**	**10**	**3**	**10989**	**993059**	**450**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 4 SCRs (50% overlap)	**25**	**113**	**161**	**0**	**20**	**6**	**21979**	**1986117**	**901**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a
TOTAL for 6 SCRs (75% overlap)	**37**	**169**	**241**	**0**	**30**	**8**	**32968**	**2979176**	**1351**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a
TOTAL for 8 SCRs	**50**	**226**	**322**	**0**	**40**	**11**	**43957**	**3972235**	**1801**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a	n/a	n/a

Worksheet B-13: Alternative C - Summary for Group I Units

Peak Operation	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CO2	CO2
Once Every Five Years	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/year	metric tons/year
Delivery Vehicles - Removing Spent Catalyst	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
Delivery Vehicles - Fresh Catalyst	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
Subtotal	1.12	4.45	13.82	0.02	0.66	0.58	1688.18	1688.18	0.77
Once Per Month									
Delivery Vehicles - NH3 for 1 SCR	0.56	2.22	6.91	0.01	0.33	0.29	844.09	10129.10	4.59
Delivery Vehicles - NH3 for 8 SCRs - annual only								81032.77	36.75
TOTAL for 1 SCR	**2**	**7**	**21**	**0**	**1**	**1**	**2532**	**11817**	**5**
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 2 SCRs (overlap on same day)	**3**	**13**	**41**	**0**	**2**	**2**	**5065**		
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a		
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a		

Worksheet B-14: Alternative C - Summary for Group II Units

Alternative C: Group II Units - 173 ammonia tanks for 173 SCRs built in Year 2011

Peak Construction	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CO2 lbs/year	CO2 metric tons/year
PHASE 1a: Fugitive Dust Emissions Associated with Installing Berm for 1 SCR Ammonia Storage Tank*	**0**	**0**	**0**	**0**	**2.56**	**0.54**	**0**	**0**	**0**
*Reflects 61% mitigation due to watering									
PHASE 1b: Install 1 SCR on 1 Group II Unit									
Combustion Equipment	3.69	12.37	19.80	0.02	1.49	0.00	1934.20	251446.00	114.03
Vehicles	1.42	11.37	6.63	0.02	0.35	0.28	1872.27	243395.17	110.38
PHASE 1b SUBTOTAL for 1 SCR	**5.12**	**23.74**	**26.42**	**0.04**	**1.84**	**0.28**	**3806.47**	**494841.17**	**224.42**
PHASE 2: Deliver Catalyst & Initially Fill NH3 tank									
Delivery Vehicle - Fresh Catalyst	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
Delivery Vehicle - NH3	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
PHASE 2 SUBTOTAL for 1 SCR	**1.12**	**4.45**	**13.82**	**0.02**	**0.66**	**0.58**	**1688.18**	**1688.18**	**0.77**
TOTAL for 1 SCR	**6**	**28**	**40**	**0**	**5**	**1**	**5495**	**496529**	**225**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 43 SCRs (25% overlap)	**268**	**1212**	**1731**	**2**	**218**	**60**	**236270**	**21350762**	**9683**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	**YES**	**YES**	**YES**	NO	**YES**	**YES**	n/a	n/a	n/a
TOTAL for 87 SCRs (50% overlap)	**543**	**2453**	**3501**	**5**	**440**	**121**	**478035**	**43198054**	**9683**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	**YES**	**YES**	**YES**	NO	**YES**	**YES**	n/a	n/a	n/a
TOTAL for 130 SCRs (75% overlap)	**811**	**3665**	**5232**	**7**	**658**	**181**	**714305**	**64548816**	**29274**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	**YES**	**YES**	**YES**	NO	**YES**	**YES**	n/a	n/a	n/a
TOTAL for 173 SCRs	**1079**	**4877**	**6962**	**10**	**876**	**241**	**950575**	**85899578**	**38957**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	**YES**	**YES**	**YES**	NO	**YES**	**YES**	n/a	n/a	n/a

Worksheet B-14: Alternative C - Summary for Group II Units

Peak Operation	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CO2	CO2
Once Every Five Years	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/year	metric tons/year
Delivery Vehicle - Removing Spent Catalyst	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
Delivery Vehicle - Fresh Catalyst	0.56	2.22	6.91	0.01	0.33	0.29	844.09	844.09	0.38
Subtotal	1.12	4.45	13.82	0.02	0.66	0.58	1688.18	1688.18	0.77
Once Per Month									
Delivery Vehicle - NH3 for 1 SCR	0.56	2.22	6.91	0.01	0.33	0.29	844.09	10129.10	4.59
Delivery Vehicle - NH3 for 173 SCRs - annual only								1752333.66	794.71
TOTAL for 1 SCR	**2**	**7**	**21**	**0**	**1**	**1**	**2532**	**11817**	**5**
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
TOTAL for 10 SCRs (overlap on same day)	**17**	**67**	**207**	**0**	**10**	**9**	**25323**		
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55	n/a		
SIGNIFICANT?	NO	NO	**YES**	NO	NO	NO	n/a		

Worksheet B-15: PAR 1146
NOx Emission Reductions

Proposed Project	NOx (lbs/day)	NOx (ton/day)	Construction during	Full Compliance by
8 Group I Units:				
Baseline at 30 ppm	386.19	0.19		
Emission Reductions at 5 ppm*	321.83	0.16	2012	2013
*Compliance via SCRs				
9 Group II Units:				
Baseline at 30 ppm	80.57	0.04		
Emission Reductions at 5 ppm*	67.15	0.03	75% in 2013 & 100% in 2015	75% in 2014 & 100% in 2016
*Compliance via SCRs (Enhanced)				
164 Group II Units:				
Baseline at 30 ppm	1468.24	0.73		
Emission Reductions at 9 ppm*	1027.77	0.51	75% in 2011 & 100% in 2013	75% in 2012 & 100% in 2014
*Compliance via Ultra Low-NOx Burners (Standard)				
739 Group III Units (614 sealed + 125 atmospheric):				
Baseline at 30 ppm	1013.49	0.51		
Emission Reductions at 9 ppm* for 614 sealed units	589.44	0.29	75% in 2012 & 100% in 2014	75% in 2013 & 100% in 2015
Emission Reductions at 12 ppm* for 125 atmospheric units	102.86	0.05	100% in 2013	100% in 2014
Total Emission Reductions for Group III units	692.30	0.35		
*Compliance via Ultra Low-NOx Burners				
133 Low Usage Units (≤ 90,000 therms/yr):				
Baseline at 60 ppm	239.87	0.12		
Emission Reductions at 30 ppm*	119.93	0.06	2014 or later	2015 or later
*Compliance via Ultra Low-NOx Burners				
9 Landfill Gas Units:				
Baseline at 30 ppm	471.33	0.24		
Emission Reductions at 25 ppm*	78.56	0.04	2014	2015
*Compliance via Ultra Low-NOx Burners				
9 ~~6~~ Digester Gas Units:				
Baseline at 30 ppm	78.47	0.04		
Emission Reductions at 15 ppm	39.23	0.02	2014	2015
Total Emission Reductions:	**2346.76**	**1.17**		

Worksheet B-16: Alternative B - NOx Emission Reductions

Alternative B: Ultra-Low Nox Burners All Compliance via Ultra Low-NOx Burners	**NOx (lbs/day)**	**NOx (ton/day)**	**Construction during**	**Full Compliance by**
8 Group I Units:				
Baseline at 30 ppm	386.19	0.19	2014	2015
Emission Reductions at 9 ppm	270.34	0.14		
173 Group II Units:				
Baseline at 30 ppm	1548.81	0.77		
Emission Reductions at 12 ppm	929.29	0.46	2015	2016
739 Group III Units (614 sealed + 125 atmospheric):				
Baseline at 30 ppm	1013.49	0.51		
Emission Reductions at 15 ppm	506.74	0.25	2016	2017
133 Low Usage Units (≤ 90,000 therms/yr):				
Baseline at 60 ppm	239.87	0.12		
Emission Reductions at 40 ppm	79.96	0.04	2016 or later	2017 or later
9 Landfill Gas Units:				
Baseline at 30 ppm	471.33	0.24		
Emission Reductions at 25 ppm	78.56	0.04	2017	2018
9 ~~6~~ Digester Gas Units:				
Baseline at 30 ppm	78.47	0.04		
Emission Reductions at 15 ppm	39.23	0.02	2017	2018
Total Emission Reductions:	**1904.11**	**0.95**		

Worksheet B-17: Alternative C - NOx Emission Reductions

Alternative C: Expedited Compliance	NOx (lbs/day)	NOx (ton/day)	Construction during	Full Compliance by
8 Group I Units:				
Baseline at 30 ppm	386.19	0.19		
Emission Reductions at 5 ppm*	321.83	0.16	2011	2012
*Compliance via SCRs				
173 Group II Units:				
Baseline at 30 ppm	1548.81	0.77		
Emission Reductions at 5 ppm*	1290.68	0.65	2011	2012
*Compliance via SCRs				
739 Group III Units (614 sealed + 125 atmospheric):				
Baseline at 30 ppm	1013.49	0.51		
Emission Reductions at 9 ppm* for 614 sealed units	589.44	0.29	2012	2013
Emission Reductions at 12 ppm* for 125 atmospheric units	102.86	0.05	2012	2013
Total Emission Reductions for Group III units	692.30	0.35		
*Compliance via Ultra Low-NOx Burners				
133 Low Usage Units (<u>≤</u> 90,000 therms/yr):				
Baseline at 60 ppm	239.87	0.12		
Emission Reductions at 20 ppm*	159.91	0.08	2014	2015
*Compliance via Ultra Low-NOx Burners				
9 Landfill Gas Units:				
Baseline at 30 ppm	471.33	0.24		
Emission Reductions at 25 ppm*	78.56	0.04	2012	2013
*Compliance via Ultra Low-NOx Burners				
<u>9</u> ~~6~~ Digester Gas Units:				
Baseline at 30 ppm	<u>78.47</u>	0.04		
Emission Reductions at 15 ppm	<u>39.23</u>	0.02	2012	2013
Total Emission Reductions:	**<u>2582.51</u>**	**1.29**		

Worksheet B-18: Alternative D - NOx Emission Reductions

Alternative D: End of Life Replacement	NOx (lbs/day)	NOx (ton/day)	Construction during	Full Compliance by
8 Group I Units:				
Baseline at 30 ppm	386.19	0.19		
Emission Reductions at 5 ppm*	321.83	0.16	within 15 years of installation date	within 16 years of installation date
*Compliance via SCRs				
173 Group II Units:				
Baseline at 30 ppm	1548.81	0.77		
Emission Reductions at 5 ppm*	1290.68	0.65	within 15 years of installation date	within 16 years of installation date
*Compliance via SCRs				
739 Group III Units:				
Baseline at 30 ppm	1013.49	0.51		
Emission Reductions at 9 ppm* for 614 sealed units	589.44	0.29	within 15 years of installation date	within 16 years of installation date
Emission Reductions at 12 ppm* for 125 atmospheric units	102.86	0.05	within 15 years of installation date	within 16 years of installation date
Total Emission Reductions for Group III units	692.30	0.35		
*Compliance via Ultra Low-NOx Burners				
133 Low Usage Units (≤ 90,000 therms/yr):				
Baseline at 60 ppm	239.87	0.12		
Emission Reductions at 30 ppm*	119.93	0.06	within 15 years of installation date	within 16 years of installation date
*Compliance via Ultra Low-NOx Burners				
9 Landfill Gas Units:				
Baseline at 30 ppm	471.33	0.24		
Emission Reductions at 25 ppm*	78.56	0.04	2014	2015
*Compliance via Ultra Low-NOx Burners				
9 ~~6~~ Digester Gas Units:				
Baseline at 30 ppm	78.47	0.04		
Emission Reductions at 15 ppm*	39.23	0.02	2014	2015
*Compliance via Ultra Low-NOx Burners				
Total Emission Reductions:	**2542.53**	**1.27**		

Worksheet B-19:

CO2 Emission Changes Resulting From Proposed Project

Low Therm With Compliance Plan (Equipment Population)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	127	0	0	3	130
20 to <75	6	0	0	0	6
75 or greater	0	0	0	0	0
Total	133	0	0	3	136

60 ppm baseline NOx for natural gas boilers
90,000 therms/yr

Non-gaseous: 12mmBTU/hr @ 80 ppm NOx and 200 hrs/yr (17600 gal diesel/yr) based on permit condition

Conversion Factors Used:
CO2 Emission Factor = 0.12 lb/~~mmBTU~~ scf
(AP-42, Table 1.4-2 - Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

1 therm = 100,000 BTU = 0.1 mmBTU
1 Metric Ton = 2,205 lb
1 scf = 1020 ~~mm~~BTU for natural gas

Low Therm With Compliance Plan (Baseline CO2 Emissions in metric tons per year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Baseline Emissions
5 to <20	0.0610	0.0000	0.0000	0.0004	0.0614
20 to <75	0.0029	0.0000	0.0000	0.0000	0.0029
75 or greater	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0639	0.0000	0.0000	0.0004	0.0642
				Fuel penalty 2%	0.0013

All R1146 Units w/o Compliance Plan (Equipment Population)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	739	2	4	0	745
20 to <75 -ulnb	164	0	5	0	169
20 to <75-SCR	9	0	0	0	9
75 or greater	8	7	0	0	15
Total	920	9	9	0	938

Natural Gas: 30 ppm baseline Nox;
Boiiler Ratings: 6.25 mmbtu/hr @ 25% load
34 mmbtu/hr@ 30% load; 100mmbtu/hr @ 55% load

Landfill: 30 ppm NOx baseline;
10 mmbtu/hr and 125 mmbtu/hr rating at 60% load

Digester: 6 and 25 mmbtu/hr rating @ 60% load

All R1146 Units w/o Compliance Plan (Baseline CO2 Emissions in metric tons/year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Baseline Emissions
5 to <20	0.540	0.006	0.007	0.000	0.552
20 to <75 -ulnb	0.782	0.000	0.035	0.000	0.817
20 to <75-SCR	0.043	0.000	0.000	0.000	0.043
75 or greater-SCI	0.206	0.245	0.000	0.000	0.451
Total	1.570	0.251	0.042	0.000	1.863

Worksheet B-19:
CO2 Emission Changes Resulting From Proposed Project

All R1146 Units w/o Compliance Plan (CO2 Emissions Increase in metric tons/year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	CO2 Increased Emissions
5 to <20	0.0108	0.00011	0.0001	0.0000	0.0110
20 to <75 -ulnb	0.0156	0.00000	0.0007	0.0000	0.0163
20 to <75-SCR	0.0021	0.00000	0.0000	0.0000	0.0021
75 or greater	0.0103	0.00491	0.0000	0.0000	0.0152
Total	0.0389	0.00502	0.0008	0.0000	0.0447

Fuel Penalty: 2% for ultra low-Nox burners and 5% for SCRs

All R1146 Units: Total Equipment Population

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	866	2	4	3	875
20 to <75	173	0	5	0	178
75 or greater	8	7	0	0	15
Total	1,047	9	9	3	1,068

All R1146 Units: Total Baseline Emissions (metric tons)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Baseline Emissions
5 to <20	0.6007	0.0056	0.0067	0.0004	0.6134
20 to <75	0.7847	0.0000	0.0351	0.0000	0.8198
75 or greater	0.2057	0.2454	0.0000	0.0000	0.4510
Total	1.5910	0.2510	0.0418	0.0004	1.8842

Worksheet B-20:
CO2 Emission Changes Resulting From Alternative B

Low Therm With Compliance Plan (Equipment Population)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	127	0	0	3	130
20 to <75	6	0	0	0	6
75 or greater	0	0	0	0	0
Total	133	0	0	3	136

60 ppm baseline NOx for natural gas boilers
90,000 therms/yr

1 therm = 100,000 BTU = 0.1 mmBTU
1 Metric Ton = 2,205 lb
1 scf = 1020 ~~mm~~BTU for natural gas

Non-gaseous: 12mmbtu/hr @ 80 ppm NOx and 200 hrs/yr (17600 gal diesel/yr) based on permit condition

Low Therm With Compliance Plan (Baseline CO2 Emissions in metric tons per year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Baseline Emissions
5 to <20	0.0610	0.000	0.000	0.0004	0.061
20 to <75	0.0029	0.000	0.000	0.0000	0.003
75 or greater	0.0000	0.000	0.000	0.0000	0.000
Total	0.0639	0.000	0.000	0.0004	0.064
				Fuel Penalty 2%	0.0013

Conversion Factors Used:
CO2 Emission Factor = 0.12 lb/~~mmBTU~~ scf
(AP-42, Table 1.4-2 - Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

All R1146 Units w/o Compliance Plan (Equipment Population)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	739	2	4	0	745
20 to <75	173	0	5	0	178
75 or greater	8	7	0	0	15
Total	920	9	9	0	938

Natural Gas: 30 ppm baseline Nox;
Boiiler Ratings: 6.25 mmbtu/hr @ 25% load
34 mmbtu/hr@ 30% load; 100mmbtu/hr @ 55% load

Landfill: 30 ppm Nox baseline;
10 mmbtu/hr and 125 mmbtu/hr rating at 60% CF

All R1146 Units w/o Compliance Plan (Baseline CO2 Emissions in metric tons/year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Baseline Emissions
5 to <20	0.540	0.006	0.007	0.000	0.552
20 to <75	0.825	0.000	0.035	0.000	0.860
75 or greater	0.206	0.245	0.000	0.000	0.451
Total	1.570	0.251	0.042	0.000	1.863
				Fuel Penalty 2%	0.037

Digester: 6 and 25 mmbtu/hr rating @ 60% CF

Natural Gas: 30 ppm baseline Nox;
Boiiler Ratings: 6.25 mmbtu/hr @ 25% CF
34 mmbtu/hr@ 30% CF; 100mmbtu/hr @ 55% CF

Worksheet B-20:
CO2 Emission Changes Resulting From Alternative B

All R1146 Units w/o Compliance Plan (CO2 Emissions Increase in metric tons/year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	CO2 Increased Emissions
5 to <20	0.011	0.000	0.000	0.000	0.011
20 to <75	0.016	0.000	0.001	0.000	0.017
75 or greater	0.004	0.005	0.000	0.000	0.009
Total	0.031	0.005	0.001	0.000	0.037

*assumes all with ultra low-Nox burners

Landfill: 30 ppm Nox baseline;
10 mmbtu/hr and 125 mmbtu/hr rating at 60% CF

Digester: 6 and 25 mmbtu/hr rating @ 60% CF

Fuel Penalty: 2% for ultra low-Nox burners

All R1146 Units: Total Equipment Population

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	866	2	4	3	875
20 to <75	179	0	5	0	184
75 or greater	8	7	0	0	15
Total	1053	9	9	3	1074

All R1146 Units: Total Baseline Emissions (tpd)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Baseline Emissions
5 to <20	0.601	0.006	0.007	0.000	0.61
20 to <75	0.828	0.000	0.035	0.000	0.86
75 or greater	0.206	0.245	0.000	0.000	0.45
Total	1.634	0.251	0.042	0.000	1.93

Worksheet B-21:
CO2 Emission Changes Resulting From Alternatives C and D

Low Therm With Compliance Plan (Equipment Population)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	127	0	0	3	130
20 to <75	6	0	0	0	6
75 or greater	0	0	0	0	0
Total	133	0	0	3	136

60 ppm baseline NOx for natural gas boilers and 90,000 therms/yr

Non-gaseous: 12mmBTU/hr @ 80 ppm NOx and 200 hrs/yr (17600 gal diesel/yr) based on permit condition

Low Therm With Compliance Plan (Baseline CO2 Emissions in metric tons per year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Baseline Emissions
5 to <20	0.061	0.000	0.000	0.0004	0.061
20 to <75	0.003	0.000	0.000	0.0000	0.003
75 or greater	0.000	0.000	0.000	0.0000	0.000
Total	0.064	0.000	0.000	0.0004	0.064
				Fuel penalty 2%	0.001

Conversion Factors Used:
CO2 Emission Factor = 0.12 lb/~~mmBTU~~ scf
(AP-42, Table 1.4-2 - Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

1 therm = 100,000 BTU = 0.1 mmBTU
1 Metric Ton = 2,205 lb
1 scf = 1020 ~~mm~~BTU for natural gas

All R1146 Units w/o Compliance Plan (Equipment Population)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	739	2	4	0	745
20 to <75	173	0	5	0	178
75 or greater	8	7	0	0	15
Total	920	9	9	0	938

Natural Gas: 30 ppm baseline Nox;
Boiiler Ratings: 6.25 mmbtu/hr @ 25% load
34 mmbtu/hr@ 30% load; 100mmbtu/hr @ 55% load

All R1146 Units w/o Compliance Plan (Baseline CO2 Emissions in metric tons/year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Baseline Emissions
5 to <20 w/uln	0.540	0.006	0.007	0.000	0.552
20 to <75 w/S	0.825	0.000	0.035	0.000	0.860
75 or greater	0.206	0.245	0.000	0.000	0.451
Total	1.570	0.251	0.042	0.000	1.863

Landfill: 30 ppm NOx baseline;
10 mmbtu/hr and 125 mmbtu/hr rating at 60% load

Digester: 6 and 25 mmbtu/hr rating @ 60% load

Worksheet B-21:
CO2 Emission Changes Resulting From Alternatives C and D

All R1146 Units w/o Compliance Plan (CO2 Emissions Increase in metric tons/year)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	CO2 Increased Emissions
5 to <20 w/uln	0.011	0.000	0.000	0.000	0.011
20 to <75 w/S	0.041	0.000	0.001	0.000	0.042
75 or greater	0.010	0.005	0.000	0.000	0.015
Total	0.062	0.005	0.001	0.000	0.068

Fuel Penalty: 2% for ultra low-Nox burners and 5% for SCRs

All R1146 Units: Total Equipment Population

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Units
5 to <20	866	2	4	3	875
20 to <75	179	0	5	0	184
75 or greater	8	7	0	0	15
Total	1053	9	9	3	1074

All R1146 Units: Total Baseline Emissions (tpd)

Size Range mm btu/hr	Natural Gas	Landfill Gas	Digester Gas	Non-Gaseous Fuel	Total Baseline Emissions
5 to <20	0.601	0.006	0.007	0.000	0.61
20 to <75	0.828	0.000	0.035	0.000	0.86
75 or greater	0.206	0.245	0.000	0.000	0.45
Total	1.634	0.251	0.042	0.000	1.93

Retrofit with Ultra-Low Nox Burners in 2011

PAR 1146 Affected Equipment	No. of Units	Construction Activity
Group II Unit: Boiler, Steam Generator, or Process Heater	1	Install Ultra-Low NOx burners on 123 Group II units during 2011

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)	0.0758	0.2203	0.2818	0.0003	0.0258	25.6000

*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)	0.00085	0.00826	0.00084	0.00001	0.00009	0.00006	1.10235
Offsite (Delivery Truck - pickup truck)	0.00085	0.00826	0.00084	0.00001	0.00009	0.00006	1.10235

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2011

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

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	0.15	0.44	0.56	0.00	0.05	51.20
TOTAL	**0.15**	**0.44**	**0.56**	**0.00**	**0.05**	**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)	0.09	0.83	0.08	0.00	0.01	0.01	110.24
Offsite (Delivery Truck - pickup truck)	0.17	1.65	0.17	0.00	0.02	0.01	220.47
TOTAL	**0.26**	**2.48**	**0.25**	**0.00**	**0.03**	**0.02**	**330.71**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2011)
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

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
Group I: Equipment & Workers' Vehicles (1 unit)	**0**	**3**	**1**	**0.00**	**0**	**0.02**	**382**
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	1.182	2.36	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	**2.36**	**7.50**	

*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 2011.

***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 2012

PAR 1146 Affected Equipment	No. of Units	Construction Activity
Combo of Group II & III Units: Boiler, Steam Generator, or Process Heater	1	Install Ultra-Low NOx burners on 41 Group II units and 461 Group III units (sealed) during 2012

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)	0.0703	0.2150	0.2702	0.0003	0.0243	25.6000

*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)	0.00080	0.00765	0.00078	0.00001	0.00009	0.00006	1.10153
Offsite (Delivery Truck - pickup truck)	0.00080	0.00765	0.00078	0.00001	0.00009	0.00006	1.10153

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2012

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

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	0.14	0.43	0.54	0.00	0.05	51.20
TOTAL	**0.14**	**0.43**	**0.54**	**0.00**	**0.05**	**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)	0.08	0.77	0.08	0.00	0.01	0.01	110.15
Offsite (Delivery Truck - pickup truck)	0.16	1.53	0.16	0.00	0.02	0.01	220.31
TOTAL	**0.24**	**2.30**	**0.23**	**0.00**	**0.03**	**0.02**	**330.46**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2012)
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

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
Group I: Equipment & Workers' Vehicles (1 unit)	**0**	**3**	**1**	**0.00**	**0**	**0.02**	**382**
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	1.18	2.36	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	**2.36**	**7.50**	

*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 2012.

***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 2013

PAR 1146 Affected Equipment	No. of Units	Construction Activity
Group III Units: Boiler, Steam Generator, or Process Heater	1	Install Ultra-Low NOx burners on 125 Group III atmospheric units during 2013

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)	0.0589	0.2041	0.2436	0.0003	0.0206	25.6

*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)	0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087
Offsite (Delivery Truck - pickup truck)	0.00075	0.00709	0.00071	0.00001	0.00009	0.00006	1.10087

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2013

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

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	0.12	0.41	0.49	0.00	0.04	51.20
TOTAL	**0.12**	**0.41**	**0.49**	**0.00**	**0.04**	**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)	0.07	0.71	0.07	0.00	0.01	0.01	110.09
Offsite (Delivery Truck - pickup truck)	0.15	1.42	0.14	0.00	0.02	0.01	220.17
TOTAL	**0.22**	**2.13**	**0.21**	**0.00**	**0.03**	**0.02**	**330.26**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2013)
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

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
Group I: Equipment & Workers' Vehicles (1 unit)	**0**	**3**	**1**	**0.00**	**0**	**0.02**	**381**
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	1.179	2.36	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	**2.36**	**7.50**	

*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 2013.

***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 2014

PAR 1146 Affected Equipment	No. of Units	Construction Activity
Group III Units plus Low Usage, Landfill, & Digester Gas Units: Boiler, Steam Generator, or Process Heater	**1**	**Install Ultra-Low NOx burners on 153 Group III sealed units and 148 low usage, landfill and digester gas uni**

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)	0.0589	0.2041	0.2436	0.0003	0.0206	25.6

*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)	0.00070	0.00660	0.00065	0.00001	0.00009	0.00006	1.10257
Offsite (Delivery Truck - pickup truck)	0.00070	0.00660	0.00065	0.00001	0.00009	0.00006	1.10257

Source: CARB's Off-Road Mobile Source Emission Factors for Scenario Year 2014

Passenger Vehicles/Delivery Trucks: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls, http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls, and http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls

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	0.12	0.41	0.49	0.00	0.04	51.20
TOTAL	**0.12**	**0.41**	**0.49**	**0.00**	**0.04**	**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)	0.07	0.66	0.07	0.00	0.01	0.01	110.26
Offsite (Delivery Truck - pickup truck)	0.14	1.32	0.13	0.00	0.02	0.01	220.51
TOTAL	**0.21**	**1.98**	**0.20**	**0.00**	**0.03**	**0.02**	**330.77**

Source: EMFAC 2007 (v2.3) Emission Factors (On-Road Vehicles, Scenario Year 2011)
http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls

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
Group I: Equipment & Workers' Vehicles (1 unit)	**0**	**2**	**1**	**0.00**	**0**	**0.02**	**382**
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**	

*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 2011, 2012, 2013 & 2014

Peak Construction	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 lbs/day	CO2 lbs/year	CO2 metric tons/year
2011									
TOTAL for 1 unit in one day	**0.41**	**2.92**	**0.82**	**0.00**	**0.08**	**0.02**	**381.91**	**381.91**	**0.17**
Peak Daily TOTAL for 10 units installed in one day	**4.07**	**29.19**	**8.17**	**0.04**	**0.78**	**0.17**	**3819.05**	n/a	n/a
Peak TOTAL for 123 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**46974.37**	**21.30**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
2012									
TOTAL for 1 unit in one day	**0.38**	**2.73**	**0.77**	**0.00**	**0.08**	**0.02**	**381.66**	**381.66**	**0.17**
Peak Daily TOTAL for 10 units installed in one day	**3.79**	**27.26**	**7.73**	**0.04**	**0.76**	**0.17**	**3816.58**	n/a	n/a
Peak TOTAL for 505 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**192737.10**	**87.41**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
2013									
TOTAL for 1 unit in one day	**0.34**	**2.54**	**0.70**	**0.00**	**0.07**	**0.02**	**381.46**	**381.46**	**0.17**
Peak Daily TOTAL for 10 units installed in one day	**3.41**	**25.36**	**7.01**	**0.04**	**0.68**	**0.18**	**3814.62**	n/a	n/a
Peak TOTAL for 125 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**47682.79**	**21.62**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a
2014									
TOTAL for 1 unit in one day	**0.33**	**2.39**	**0.68**	**0.00**	**0.07**	**0.02**	**381.97**	**381.97**	**0.17**
Peak Daily TOTAL for 10 units installed in one day	**3.28**	**23.89**	**6.84**	**0.04**	**0.69**	**0.18**	**3819.72**	n/a	n/a
Peak TOTAL for 301 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**114973.46**	**52.14**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55	n/a	n/a	n/a
SIGNIFICANT?	NO	NO	NO	NO	NO	NO	n/a	n/a	n/a

APPENDIX C

NOTICE OF PREPARATION AND INITIAL STUDY

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

SUBJECT: **NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL ASSESSMENT**

PROJECT TITLE: **PROPOSED AMENDED RULE 1146 – EMISSIONS OF OXIDES OF NITROGEN FROM INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS**

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD), as the Lead Agency, has prepared this Notice of Preparation (NOP) and Initial Study (IS). This NOP serves two purposes: 1) to solicit information on the scope of the environmental analysis for the proposed project, and 2) to notify the public that the SCAQMD will prepare a Draft Environmental Assessment (EA) to further assess potential environmental impacts that may result from implementing the proposed project.

This letter, NOP and the attached IS 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.

Comments focusing on your area of expertise, your agency's area of jurisdiction, or issues relative to the environmental analysis should be addressed to Ms. Barbara Radlein (c/o CEQA) at the address shown above, or sent by FAX to (909) 396-3324 or by e-mail to bradlein@aqmd.gov. Comments must be received no later than 5:00 PM on Friday, February 29, 2008. Please include the name and phone number of the contact person for your agency. Questions relative to the proposed amended rule should be directed to Mr. Gary Quinn at (909) 396-3121.

The Public Hearing for the proposed amended rule is scheduled for June 6, 2008. (Note: Public meeting dates are subject to change).

Date: January 30, 2008 **Signature:** Steve Smith

Steve Smith, Ph.D.
Program Supervisor
Planning, Rules, and Area Sources

Reference: California Code of Regulations, Title 14, Sections 15082(a), 15103, and 15375

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765-4178

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL ASSESSMENT

Project Title:
Draft Environmental Assessment for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

Project Location:
South Coast Air Quality Management District (SCAQMD) area of jurisdiction 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 and the Mojave Desert Air Basin

Description of Nature, Purpose, and Beneficiaries of Project:
SCAQMD staff is proposing amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters to reduce the allowable NOx emission limits from 30 parts per million (ppm) to 12, nine, or five ppm, depending on equipment size, operational characteristics, and energy efficiency. The proposed amendments to Rule 1146 will also propose NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes are proposed that include: 1) establishing annual tune-up procedures and monthly maintenance procedures; 2) limiting timeframe for derating equipment; and, 3) allowing a 30 ppm NOx compliance limit for low fuel usage equipment by January 1, 2015, or until burner replacement, which ever occurs later. Other minor changes are proposed for clarity and consistency throughout the rule. The Initial Study identified "air quality" and "hazards and hazardous materials" as the only areas that may be adversely affected by the proposed project. Impacts to these environmental areas will be further analyzed in the Draft EA.

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

Initial Study and all supporting documentation are available at:	**or by calling:**	**or by accessing the SCAQMD's website at:**
SCAQMD Headquarters 21865 Copley Drive Diamond Bar, CA 91765	(909) 396-2039	http://www.aqmd.gov/ceqa/aqmd.html

The Public Notice of Preparation is provided through the following:

☑ Los Angeles Times (January 31, 2008) ☑ AQMD Website ☑ AQMD Mailing List

Initial Study 30-day Review Period:
January 31, 2008 – February 29, 2008

Scheduled Public Meeting Dates (subject to change):
Public Workshop & CEQA Scoping Meeting: To be Determined
SCAQMD Governing Board Hearing: June 6, 2008, 9:00 a.m.; SCAQMD Headquarters

Send CEQA Comments to:	**Phone:**	**Email:**	**Fax:**
Ms. Barbara Radlein	(909) 396-2716	bradlein@aqmd.gov	(909) 396-3324

Direct Questions on Proposed Amendments:	**Phone:**	**Email:**	**Fax:**
Mr. Gary Quinn	(909) 396-3121	gquinn@aqmd.gov	(909) 396-3324

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Initial Study for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

January 2008

SCAQMD No. 013008BAR

Author: Barbara Radlein — Air Quality Specialist

Reviewed By:
- Steve Smith, Ph.D. — Program Supervisor, CEQA
- Joe Cassmassi — Planning and Rules Manager, Planning, Rule Development, and Area Sources
- Gary Quinn, P.E. — Program Supervisor, Planning, Rule Development, and Area Sources
- Kurt Wiese — District Counsel

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Cities Representative, San Bernardino County

VACANT
Cities Representative, Los Angeles County, Eastern Region

EXECUTIVE OFFICER:
BARRY R. WALLERSTEIN, D.Env.

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INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[9] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin referred to herein as the district. By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all federal and state ambient air quality standards for the district[10]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[11]. The 2007 AQMP concluded that major reductions in emissions of volatile organic compounds (VOCs), oxides of sulfur (SOx) and oxides of nitrogen (NOx) are necessary to attain the air quality standards for ozone (the key ingredient of smog) and particulate matter (PM10 and PM2.5). Ozone, a criteria pollutant, is formed when VOCs react with NOx in the atmosphere and has been shown to adversely affect human health and to contribute to the formation of PM10 and PM2.5.

Adopted in September 1988, Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, applies to most boilers, steam generators and process heaters with a rated heat input capacity greater than or equal to five million British Thermal Units per hour (mmBTU/hr) and are used in industrial, institutional, and commercial operations. However, Rule 1146 does not regulation NOx emissions from electric utility boilers, petroleum refinery boilers and process heaters with a rated heat input capacity greater than 40 mmBTU/hr, sulfur plant reactor boilers, waste heat recovery boilers serving combustion turbines, and an unfired waste heat recovery boiler that is used to recover heat from the exhaust of any combustion equipment as NOx emissions from these equipment are regulated by other stationary source rules.

The primary objectives of the currently proposed amendments to Rule 1146 (PAR 1146) are to reduce the allowable NOx emission limits from 30 parts per million (ppm) to 12, nine or five ppm, depending on equipment size, operational characteristics, and energy efficiency. PAR 1146 will also propose NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes are proposed that include: 1) establishing annual tune-up procedures and monthly maintenance procedures; 2) limiting timeframe for derating equipment; and, 3) allowing a 30 ppm NOx compliance limit for low fuel usage equipment by January 1, 2015, or until burner replacement, which ever occurs later. Another objective of PAR 1146 is to comply with all feasible measures specified in the July 2006 demonstration to the United States Environmental Protection Agency (EPA) that SCAQMD's current air pollution rules fulfill the 8-hour ozone Reasonably Available Control Technology (RACT) standards. Other minor changes are proposed for clarity and consistency throughout the rule. PAR 1146 is estimated to reduce approximately 1.3 tons per day of NOx emissions by 2017. Despite this projected environmental benefit to air quality, this Initial Study, prepared pursuant to the California Environmental Quality Act (CEQA), identified "air quality" during construction activities and "hazards and hazardous materials" during operational activities as the only areas that may be adversely affected by the proposed project. Impacts to these environmental areas will be further analyzed in the Draft EA.

[9] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health & Safety Code, §§40400-40540).
[10] Health & Safety Code, §40460 (a).
[11] Health & Safety Code, §40440 (a).

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PAR 1146 is considered a "project" as defined by CEQA. CEQA requires that the 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's 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 when an impact is significant.

California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The SCAQMD's regulatory program was certified by the Secretary of Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110. Pursuant to Rule 110 (the rule which implements the SCAQMD's certified regulatory program), SCAQMD is preparing a Draft Environmental Assessment (EA) to evaluate potential adverse impacts from the proposed project.

The SCAQMD as Lead Agency for the proposed project, has prepared this Initial Study (which includes an Environmental Checklist and project description). The Environmental Checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. The Initial Study is also intended to provide information about the proposed project to other public agencies and interested parties prior to the release of the Draft Environmental Assessment (EA). Written comments on the scope of the environmental analysis will be considered (if received by the SCAQMD during the 30-day review period) when preparing the Draft EA.

PROJECT LOCATION

PAR 1146 would apply to boilers, steam generators and process heaters with maximum rated heat input capacities greater than or equal to five mmBTU/hr that operate throughout the entire SCAQMD jurisdiction. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Basin) (Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 1-1).

PROJECT BACKGROUND

Rule 1146 regulates both NOx and CO emissions from most boilers, steam generators and process heaters with a rated heat input capacity greater than or equal to five mmBTU/hr and are used in industrial, institutional, and commercial operations. However, Rule 1146 does not regulate NOx emissions from electric utility boilers, petroleum refinery boilers and process heaters with a rated heat input capacity greater than 40 mmBTU/hr, sulfur plant reactor boilers, waste heat recovery boilers serving combustion turbines, and an unfired waste heat recovery

boiler that is used to recover heat from the exhaust of any combustion equipment. Instead, these sources are subject to other SCAQMD Rules and Regulations. Further, the NOx limits in Rule 1146 do not apply to facilities that would otherwise be subject to the NOx control requirements in Regulation XX – Regional Clean Air Incentives Market (RECLAIM).

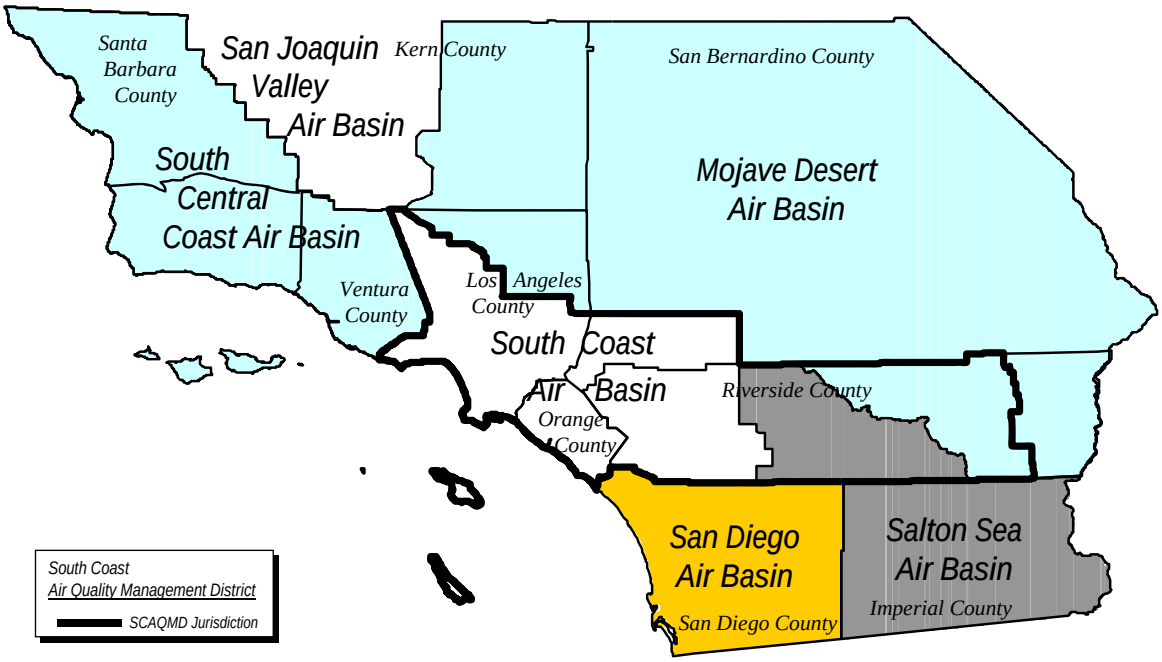

Figure 1-1
South Coast Air Quality Management District

Rule 1146 also provides compliance options for equipment that meet low fuel usage criteria. In addition to the emission limits, Rule 1146 also includes recordkeeping requirements, compliance determination procedures, a compliance schedule, exemptions, and equipment tuning procedures.

Rule 1146 applies to several types of boilers, steam generators, and process heaters. Boilers and steam generators produce hot water or steam for use in office buildings, commercial establishments, hospitals, schools, universities, hotels and various industrial operations. Process heaters are used in industrial operations for heating material streams either directly or indirectly via heat exchangers. For each application, multiple designs of boilers, steam generators and process heaters are available in the marketplace.

Under Rule 1146, any unit with an annual fuel usage that exceed 90,000 therms per year is required to either meet a 30 ppm NOx emission limit and a 400 ppm CO emission limit if the fuel burned is gaseous (i.e. natural gas), or a 40 ppm NOx emission limit and a 400 ppm CO

emission limit if the fuel burned is non-gaseous (i.e. diesel). Further, any unit that burns a combination of gaseous and non-gaseous fuel in excess of 90,000 therms annually is required to meter the quantity of each fuel used and to meet a weighted average NOx emission limit between 30 and 40 ppm.

Rule 1146 also requires continuous in-stack NOx monitoring for any unit that has a maximum rated heat input of 40 mmBTU/hr or higher and has an annual heat input of 200,000 therms. All units subject to Rule 1146 are required to conduct annual emissions testing

Rule 1146 provides an exemption from complying with NOx emission limits because of low fuel usage, provided that the fuel use is metered and either the stack gas oxygen concentration is maintained at three percent or less, on a dry basis, or the unit is tuned at least twice per year.

PROJECT OBJECTIVE

The primary objectives of PAR 1146 are to reduce the allowable NOx emission limits from 30 ppm to 12, nine or five ppm, depending on equipment size, operational characteristics, and energy efficiency. PAR 1146 will also propose NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Another objective of PAR 1146 is to comply with all feasible measures specified in the July 2006 demonstration to the EPA that SCAQMD's current air pollution rules fulfill the 8-hour ozone RACT standards. Other changes are proposed that include: 1) establishing annual tune-up procedures and monthly maintenance procedures; 2) limiting timeframe for derating equipment; and, 3) allowing a 30 ppm NOx compliance limit for low fuel usage equipment until burner replacement but no later than a 15-year equipment life. Other minor changes are proposed for clarity and consistency throughout the rule. PAR 1146 is estimated to reduce approximately 1.3 tons per day of NOx emissions by 2017.

PROJECT DESCRIPTION

The following is a summary of the key proposed amendments to Rule 1146. Other minor changes are also proposed for clarity and consistency throughout the rule. A copy of the proposed amended rule can be found in Appendix A.

Definitions

The following new definitions are added to PAR 1146: "Group I unit," "Group II unit," "Group III unit," "load-following unit," and "school."

Applicability

The applicability of PAR 1146 is expanded to also include boilers, steam generators, and process heaters at facilities equipped with multiple units that collectively have a total rated heat input of eight mmBTU/hr.

Requirements

It is expected that the objective of reducing 1.3 tons per day of additional NOx reductions can be achieved because operators of several equipment rating categories of non-RECLAIM boilers, steam generators, and process heaters have lowered NOx emission limits to 30 ppm. A summary of the proposed NOx emission limits for each equipment rating is shown in Table 1-1.

A fuel efficiency formula to adjust allowable emission limits has been added to PAR 1146 so that facilities can operate efficient boilers while achieving equivalent NOx emission reductions.

Further, for units that use dual co-fire fuels, clarifications are proposed so that the formula for calculating the weighted average is based on the appropriate compliance limit and heat input for each fuel used.

Table 1-1
Proposed NOx Emission Limits

Group Unit Number	Equipment Rating (mmBTU/hr)	Fuel Type	Current NOx Limit	Proposed NOx Limit
--	Any	non-gaseous	40 ppm	40 ppm
I	$\geq$ 75	gaseous	30 ppm; or, 0.036 lb/mmBTU	5 ppm; or, 0.0062 lb/mmBTU
II	$\leq$ 20 x < 75	gaseous (excludes landfill & digester gases)	30 ppm; or, 0.036 lb/mmBTU	5 to 9 ppm; or, 0.0062 to 0.011 lb/mmBTU
III	$\leq$ 5 x < 20 includes all load following units, plus units operated at schools & universities)	gaseous (excludes landfill & digester gases)	30 ppm; or, 0.036 lb/mmBTU	9 to 12 ppm; or, 0.011 to 0.015 lb/mmBTU
--	Any	landfill gas	30 ppm; or, 0.036 lb/mmBTU	25 ppm
--	Any	digester gas	30 ppm; or, 0.036 lb/mmBTU	15 ppm

If unit operators choose to select the tune-up option for verifying compliance, requirements for operators to keep records for a rolling 24-month period are added to PAR 1146. Other clarifications to the tune-up procedures are included for consistency throughout the rule.

Compliance Determination

Requirements for operators to conduct an emissions compliance determination at least every 250 operating hours or 30 days subsequent to the tuning or servicing of a unit are added. However, PAR 1146 will no longer allow pre-tests for emission determinations. Similarly, emission checks via portable analyzer will be required on a monthly basis or every 750 unit operating hours, whichever occurs later.

For units with a rated heat input capacity greater than or equal to 40 mmBTU/hr and an annual heat input greater than 200,000 mmBTU that are required to demonstrate compliance with the applicable NOx emission concentration limit, PAR 1146 clarifies an existing requirement for the use of either a continuous in-stack NOx monitor or equivalent verification system.

Compliance Schedule

A summary of the proposed compliance dates for each equipment rating with proposed NOx limits is shown in Table 1-2. Standard and enhanced compliance dates are provided because equipment type and operation may make it difficult for a unit to comply with the enhanced option on a continuous basis. Consequently, the standard compliance dates option is also provided to allow the unit to achieve compliance with a less stringent limit but on a more aggressive implementation schedule.

Table 1-2
Proposed Compliance Schedule

Group Unit Number	Equipment Rating (mmBTU/hr)	Fuel Type	Proposed NOx Limit	Compliance Date: Standard	Compliance Date: Enhanced
--	Any	non-gaseous	40 ppm	date of adoption	--
--	Any	gaseous	30 ppm	date of adoption	--
I	$\geq$ 75	gaseous	5 ppm; or, 0.0062 lb/mmBTU	01/01/2011	--
II	$\leq$ 20 x < 75	gaseous, but excluding landfill & digester gases	5 to 9 ppm; or, 0.0062 to 0.011 lb/mmBTU	75% by 01/01/2012; and, 100% by 01/01/2014	75% by 01/01/2014; and, 100% by 01/01/2016
III	$\leq$ 5 x < 20 (includes all load following units, plus units operated at schools & universities)	gaseous, but excluding landfill & digester gases	9 to 12 ppm; or, 0.011 to 0.015 lb/mmBTU	75% by 01/01/2013; and, 100% by 01/01/2015	75% by 01/01/2015; and, 100% by 01/01/2017
Any	Any	landfill gas	25 ppm	01/01/2015	--
Any	Any	digester gas	15 ppm	01/01/2015	--

TECHNOLOGY OVERVIEW

Combustion Equipment

To appreciate the mechanics of NOx control equipment and techniques, it is necessary to first understand how NOx emissions are generated from various combustion sources that may be potentially affected by PAR 1146 boilers, process heaters, and steam generating equipment. Combustion is a high temperature chemical reaction resulting from burning a gas, liquid, or solid fuel (e.g., natural gas, diesel, fuel oil, gasoline, propane, and coal) in the presence of air (oxygen and nitrogen) to produce: 1) heat energy; and, 2) water vapor or steam. An ideal combustion reaction is when the entire amount of fuel needed is completely combusted in the presence of air

so that only carbon dioxide (CO2) and water are produced as by-products. However, since fuel contains other components such as nitrogen and sulfur plus the amount of air mixed with the fuel can vary, in practice, the combustion of fuel is not a "perfect" reaction. As such, uncombusted fuel plus smog-forming by-products such as NOx, SOx, carbon monoxide (CO), and soot (solid carbon) can be discharged into the atmosphere.

Of the total NOx emissions that can be generated, there are two types of NOx formed during combustion: 1) thermal NOx; and, 2) fuel NOx. Thermal NOx is produced from the reaction between the nitrogen and oxygen in the combustion air at high temperatures while fuel NOx is formed from a reaction between the nitrogen already present in the fuel and the available oxygen in the combustion air. As the source of nitrogen in fuel is more prevalent in oil and coal, and is negligible in natural gas, the amount of fuel NOx generated is dependent on fuel type. For example, with oil that contains significant amounts of fuel-bound nitrogen, fuel NOx can account for up to 50 percent of the total NOx emissions generated. Though boilers, process heaters, and steam generators have varying purposes in commercial, industrial, and utility applications, at a minimum, they all generate thermal NOx as a combustion by-product. The following provides a brief description of the various types of existing combustion equipment that may be affected by PAR 1146 and subsequently retrofitted with ultra-low NOx burners or SCR NOx control equipment.

Boilers and Steam Generators

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

Process Heaters

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

NOx Control

As reducing NOx emissions is the main objective of PAR 1146, there are two primary approaches for reducing NOx emissions for the affected sources: 1) by replacing existing burners with ultra-low NOx burner technology to minimize the amount of NOx generated during combustion; or 2) by installing SCR control technology to control the NOx after it has been generated or 'post-combustion'. The possibility of other types of NOx control technologies being used to comply with PAR 1146 will be further evaluated in the Draft EA.

Staged Combustion and Ultra-Low NOx Burners

Often, fuel and air are pre-mixed prior to combustion in order to create a lower and more uniform flame temperature. Some pre-mix burners also use staged combustion with a fuel-rich zone to start combustion and stabilize the flame and a fuel lean zone to complete combustion and reduce the peak flame temperature. Stage combustion is a technique utilized in boilers, process

heaters, and steam generators to help achieve lower NOx emissions by dividing the combustion process into a number of stages in which the air-to-fuel ratio is varied to manipulate the conditions that would make NOx formation less ideal. Staged combustion is divided into two categories: staged air combustion and staged fuel combustion. Staged air combustion controls the formation of NOx by staging or staggering the total amount of air required for combustion to occur and can be achieved by installing low-NOx burners. Only a portion of the total air needed for combustion is used to form a fuel-rich primary combustion zone, in which all of the fuel is partially burned. Then, combustion is fully completed when the remainder of the combustion air is injected in a secondary zone which is located downstream of the fuel-rich primary zone. Because some heat is transferred prior to the completion of combustion, peak combustion temperatures are lower (which reduces formation of thermal NOx) with stage air combustion than with conventional combustion.

Without limiting the combustion air, staged fuel combustion controls the formation of NOx by staging the amount of fuel needed for combustion. With a high level of excess air in the primary combustion zone, the peak combustion temperature drops and subsequently reduces NOx formation. Additional fuel is later injected in the secondary combustion zone at a higher pressure and velocity than in the primary combustion zone, to stimulate flue gas recirculation and recycle the exhaust air back to the burner, further reduce combustion temperature, and decrease the availability of oxygen needed to form NOx.

Burners can also be designed to spread flames over a larger area to reduce hot spots and lower NOx emissions. Radiant pre-mix burners with ceramic, sintered metal, or metal fiber heads spread the flame to produce more radiant heat. When a burner produces more radiant heat, less heat escapes the combustion equipment through the exhaust gases. To accomplish this goal, most pre-mix burners require a blower to mix the fuel with the air before combustion takes place. However, increasing the amount of air can reduce the flame temperature along with the combustion gas temperature and in turn, reduce efficiency of the combustion unit. Further, increasing the air flow may destabilize the flame. Thus, ultra low NOx burners require sophisticated controls to maintain emission levels while optimizing combustion efficiency. Ultra-low NOx burners can achieve less than 9 ppm NOx at three percent oxygen.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is post-combustion control equipment that is considered to be Best Available Retrofit Control Technology (BARCT), if cost-effective, for NOx control of existing combustion sources like boilers, process heaters, and steam generators as it is capable of reducing NOx emissions by as much as 90 percent or higher. A typical SCR system design consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, an exhaust stack plus ancillary electronic instrumentation and operations control equipment. The way an SCR system reduces NOx is by a matrix of nozzles injecting a mixture of ammonia and air directly into the flue gas exhaust stream from the combustion equipment. As this mixture flows into the SCR reactor that is replete with catalyst, the catalyst, ammonia, and oxygen (from the air) in the flue gas exhaust reacts primarily (i.e., selectively) with NO and NO2 to form nitrogen and water in the presence of a catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. There are two main types of catalysts: one in which the catalyst is coated onto a metal structure and a ceramic-based catalyst onto which the catalyst components are calcified. Commercial catalysts used in SCRs are

available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide (TiO2) that is coated with either tungsten trioxide (WO3), molybdic anhydride (MoO3), vanadium pentoxide (V2O5), or iron oxide (Fe2O3). These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of approximately five years. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, et cetera.

For conventional SCRs, the minimum temperature for NOx reduction is 500 degrees Fahrenheit (^{o}F) and the maximum operating temperature for the catalyst is 800 ^{o}F. Depending on the application, the type of fuel combusted, and the presence of sulfur compounds in the exhaust gas, the optimum flue gas temperature of an SCR system is case-by-case and will range between 550 ^{o}F and 750 ^{o}F to limit the occurrence of several undesirable side reactions at certain conditions. One of the major concerns with the SCR process is the poisoning of the catalyst due to the presence of sulfur and the oxidation of sulfur dioxide (SO2) in the exhaust gas to sulfur trioxide (SO3) and the subsequent reaction between SO3 and ammonia to form ammonium bisulfate or ammonium sulfate. The formation of either ammonium bisulfate or ammonium sulfate depends on the amount of SO3 and ammonia present in the flue gas and can cause equipment plugging downstream of the catalyst. The presence of particulates, heavy metals and silica in the flue gas exhaust can also limit catalyst performance. However, minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range will help avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as 'ammonia slip.' Depending on the type of combustion equipment utilizing SCR technology, the typical amount of ammonia slip can vary between five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life, which is generally about five years. Permit conditions are typically place on SCR units that limit ammonia slip to 10 ppmv or less.

ALTERNATIVES

The Draft EA will discuss and compare alternatives to the proposed project as required by CEQA and by SCAQMD Rule 110. Alternatives must include realistic measures for attaining the basic objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. In addition, the range of alternatives must be sufficient to permit a reasoned choice and it need not include every conceivable project alternative. The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. Suggestions on alternatives submitted by the public will be evaluated for inclusion in the Draft EA.

SCAQMD Rule 110 does not impose any greater requirements for a discussion of project alternatives in an environmental assessment than is required for an Environmental Impact Report under CEQA. Alternatives will be developed based in part on the major components of the proposed rule. The rationale for selecting alternatives rests on CEQA's requirement to present "realistic" alternatives; that is alternatives that can actually be implemented. CEQA also requires an evaluation of a "No Project Alternative."

SCAQMD's policy document Environmental Justice Program Enhancements for fiscal year (FY) 2002-03, Enhancement II-1 recommends that all SCAQMD CEQA assessments include 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 air emissions.

The Governing Board may choose to adopt any portion or all of any alternative presented in the EA. 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 Initial Study will be considered when preparing the Draft EA.

CHAPTER 2 - ENVIRONMENTAL CHECKLIST

Introduction

General Information

Potentially Significant Impact Areas

Determination

Environmental Checklist and Discussion

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by adopting the proposed amendments to Rule 1146.

GENERAL INFORMATION

Name of Proponent:	South Coast Air Quality Management District
Address of Proponent:	21865 Copley Drive Diamond Bar, CA 91765
Lead Agency:	South Coast Air Quality Management District
CEQA Contact Person:	Barbara Radlein (909) 396-2716
Rule Contact Person:	Gary Quinn (909) 396-3121
Name of Project:	Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

POTENTIALLY SIGNIFICANT IMPACT AREAS

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. Any checked items represent areas that may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐	Aesthetics	☐	Geology and Soils	☐	Population and Housing
☐	Agricultural Resources	☑	Hazards and Hazardous Materials	☐	Public Services
☑	Air Quality	☐	Hydrology and Water Quality	☐	Recreation
☐	Biological Resources	☐	Land Use and Planning	☐	Solid/Hazardous Waste
☐	Cultural Resources	☐	Mineral Resources	☐	Transportation./Traffic
☐	Energy	☐	Noise	☑	Mandatory Findings

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline §15252, could NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will NOT be significant effects in this case because the mitigation measures described on an attached sheet have been added to the project. An ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☑ I find that the project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

Date: January 30, 2008 **Signature:** Steve Smith

Steve Smith, Ph.D.
Program Supervisor – CEQA Section
Planning, Rules, and Area Sources

ENVIRONMENTAL CHECKLIST AND DISCUSSION

SCAQMD staff is proposing amendments to Rule 1146 to reduce the allowable NOx emission limits from 30 ppm to 12, nine or five ppm, depending on equipment size, operational characteristics, and energy efficiency. PAR 1146 will also propose lower NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. PAR 1146 is estimated to reduce approximately 1.3 tons per day of NOx emissions by 2017. This portion of the proposed amendments may require installation or modification of NOx emission control equipment. Specifically, compliance with these components of PAR 1146 is expected to result in operators retrofitting existing equipment with ultra-low NOx burners or selective catalytic reduction (SCR) technology. However, based on preliminary size data of the affected equipment, only eight facilities are expected to need SCR technology to comply with PAR 1146.

Other procedural changes to Rule 1146 are proposed that would: 1) establish annual tune-up procedures and monthly maintenance procedures; 2) limit timeframe for derating equipment; and, 3) allow a 30 ppm NOx compliance limit for low fuel usage equipment until burner replacement but no later than a 15-year equipment life. Other minor changes are proposed for clarity and consistency throughout the rule. Though these procedural changes are expected to improve compliance with Rule 1146, no physical changes to the affected equipment or facilities involved are expected from this portion of the proposed project.

Therefore, upon initial examination of the proposed amendments, only the amendments proposed in Rule 1146 for the reduction of the allowable NOx emission limits are expected to involve physical changes at affected facilities which may cause potentially significant impacts to "air quality" and "hazards and hazardous materials." Therefore, the main focus of the analysis in this Initial Study is the type of emission reduction projects that may be undertaken to comply with

the proposed project (i.e. the decision to install ultra-low NOx burners or SCR). However, in addition to ultra-low NOx burners and SCR technology, the possibility of other types of NOx control technologies being used to comply with PAR 1146 will be further evaluated in the Draft EA.

Although there are other amendments proposed throughout PAR 1146 for continuity and clarity, for the aforementioned reasons, they are not expected to have an effect on emissions and, thus, will not be addressed further in this Initial Study. Therefore, the effects of implementing the reduced NOx emission limits will be the main focus of the analysis in this Initial Study.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:			
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☑
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☑	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☑	☐

Significance Criteria

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

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

Discussion

I. a), b) & c) Implementation of PAR 1146 is expected to involve construction activities related to the modification of existing equipment by installing either ultra-low NOx burners or SCR systems at industrial, commercial, and institutional facilities. However, the construction activities are not expected to adversely impact views and aesthetics resources since most of the heavy equipment and activities are expected to occur within each facility and are expected to introduce only minor visual changes to areas outside each facility, if at all, depending on the location of the construction activities within the facility. The majority of the construction equipment is expected to be low in height and not substantially visible to the surrounding area due to existing fencing along the property lines and existing structures currently within the facilities that would buffer the views of the construction activities. Further, the construction activities are expected to be temporary in nature and will cease following completion of the equipment installation or modifications.

Depending on the type of NOx emissions control employed (i.e., ultra-low NOx burners or SCR), the proposed project could potentially introduce minor visual changes at some facilities. The affected units, depending upon their locations within each facility, could potentially be visible to areas outside of each facility. However, the affected units are expected to be about the same size profile as existing equipment present at each affected facility. The general appearance of the affected units is not expected to differ significantly from other equipment units such that no significant impacts to aesthetics are expected. Further, no scenic highways or corridors are located in the vicinities of the affected facilities such that the proposed project would not obstruct scenic resources or degrade the existing visual character of a site, including but not limited to, trees, rock outcroppings, or historic buildings.

I. d) There are no components in PAR 1146 that would require construction activities to occur at night. Therefore, no additional lighting at the affected facilities would be required as a result of complying with PAR 1146. Similarly, the existing equipment subject to PAR 1146 are located in existing structures or areas that already have lighting systems in place. Further, PAR 1146 equipment are designed to be used up to 24 hours per day, so the equipment are not restricted to operate during a specific time of day. Thus, PAR 1146 contains no provisions that would require affected equipment to operate differently during existing daytime or nighttime operations. Therefore, PAR 1146 is not expected to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, the proposed project is not expected to create significant adverse aesthetic impacts.

Based upon these considerations, significant adverse impacts to aesthetics are not expected from the implementation of PAR 1146 and will not be further analyzed in the Draft EA.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
II.	**AGRICULTURE RESOURCES.** Would the project:			
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☑
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☑
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☑

Significance Criteria

Project-related impacts on agricultural resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural uses.

Discussion

II. a), b), & c) All construction and operational activities that would occur as a result of implementing PAR 1146 are expected to occur within the confines of the existing affected facilities. The proposed project would be consistent with the commercial, industrial and institutional zoning requirements for the various facilities and there are no agricultural resources or operations on or near the affected facilities. No agricultural resources including Williamson Act contracts are located within or would be impacted by construction activities at the affected facilities. Therefore, the proposed project would not result in any new construction of buildings or other structures that would convert farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract. Since PAR 1146 would not substantially change the facility or process for which the affected units are utilized, there are no provisions in PAR 1146 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agricultural resources will be altered by the proposed project

Based upon these considerations, significant agricultural resource impacts are not expected from the implementation of the proposed project and will not be further analyzed in the Draft EA.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
III. AIR QUALITY. Would the project:			
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☑	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☑	☐	☐

	Potentially Significant Impact	Less Than Significant Impact	No Impact
d) Expose sensitive receptors to substantial pollutant concentrations?	☑	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☑
f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑

Significance Criteria
To determine whether or not air quality impacts from amending Rule 1146 may be significant, impacts will be evaluated and compared to the criteria in Table 2-1. If impacts exceed any of the criteria in Table 2-1, they will be considered further in the Draft EA. As necessary, all feasible mitigation measures will be identified in the Draft EA and implemented to reduce significant impacts to the maximum extent feasible.

Discussion
Upon initial examination of the proposed amendments to Rule 1146, the portion of the proposed project that is the main focus of this analysis pertains to the proposed decrease in the allowable NOx emission standard for boilers, steam generators and process heaters with maximum rated heat input capacities greater than or equal to five mmBTU/hr. These equipment categories could feasibly undergo physical modifications such as installing ultra-low NOx burners or SCR in order to comply with the NOx emission reduction requirements in PAR 1146. In addition to ultra-low NOx burners and SCR technology, the possibility of other types of NOx control technologies being used to comply with PAR 1146 will be further evaluated in the Draft EA. The other proposed amendments in PAR 1146 are procedural in nature and will not result in an adverse air quality impact.

III. a) The SCAQMD is required by law to prepare a comprehensive district-wide AQMP which includes strategies (e.g., control measures) to reduce emission levels to achieve and maintain state and federal ambient air quality standards, and to ensure that new sources of emissions are planned and operated to be consistent with the SCAQMD's air quality goals. The AQMP's air pollution reduction strategies include control measures which target stationary, mobile and indirect sources. These control measures are based on feasible methods of attaining ambient air quality standards. Pursuant to the provisions of both the state and federal Clean Air Acts, the SCAQMD is required to attain the state and federal ambient air quality standards for all criteria pollutants, including NOx and PM10. PAR 1146 will not obstruct or conflict with the implementation of the AQMP.

Table 2-1
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction [b]**	Operation [c]
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs) and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants [d]		
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour average annual geometric average annual arithmetic mean	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation) 1.0 μg/m^3 20 μg/m^3	
PM2.5 24-hour average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation)	
Sulfate 24-hour average	1 μg/m^3	
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) 9.0 ppm (state/federal)	

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[d] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day; ppm = parts per million; μg/m^3 = microgram per cubic meter; ≥ greater than or equal to

Although PAR 1146 has the potential to temporarily increase VOC, NOx, CO, PM10 and TAC emissions (as diesel PM) that could exceed the air quality significance thresholds for construction activities, PAR 1146 is not expected to interfere with achieving 1.3 tons per day of NOx emission reductions by year 2017, which is consistent with the goals of the 2007 AQMP to achieve additional NOx emission reductions from stationary sources, which will assist in attaining state and federal PM2.5 and ozone ambient air quality standards. Further, implementation of all other SCAQMD NOx rules along with AQMP control measures, when considered together, is expected to reduce NOx emissions throughout the region overall by 2020. Therefore, implementing PAR 1146 will not conflict or obstruct implementation of the AQMP.

III. b) The objective of the proposed project is to reduce NOx emissions from the various sizes of boilers, steam generators and process heaters with maximum rated heat input capacities greater than or equal to five mmBTU/hr. The proposed project is estimated to reduce emissions up to 1.3 tons per day of NOx by the end of 2017 from these affected units. Compliance with PAR 1146 is expected to be achieved by either replacing burners of the affected units with ultra-low NOx burners or the installing SCR.

Replacing burners means that the operator will remove the old burners and retrofit the existing unit with certified ultra-low NOx burners that have been demonstrated to comply with the NOx emission standard on a retrofit basis. Any operator that chooses to retrofit an existing unit with new ultra-low NOx burners in order to comply with PAR 1146 is not expected to construct any new buildings or other structures as part of the retrofit process. However, some physical modifications would be necessary and typically involve removing the old burners, installing new burners, and installing new or reworking existing flue gas ductwork.

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. Additional work may be necessary such as upgrading the operation control system or installing a fuel injection system with electronic controls. Once the ultra-low NOx burners are in place, the combustion equipment can be fired up and can operate with lower NOx emissions. Due to the relatively straightforward nature and ease of retrofitting existing equipment with ultra-low NOx burners, no heavy duty construction activities or equipment are anticipated. Thus, no, or minimal secondary construction impacts are anticipated from retrofitting equipment with ultra-low NOx burners and operational NOx emissions will be reduced overall.

However, if an operator chooses to comply with PAR 1146 by installing SCR, implementation of the proposed project could create both direct and indirect air quality impacts. Past projects involving SCR installation have typically resulted in the greatest amount of construction emissions for an individual project (i.e., potentially significant). In addition to the modifications or replacement of the combustion sources typical of other NOx control technologies, SCR systems may also require the installation of one or more storage tanks for aqueous ammonia, which is a chronic and acutely hazardous toxic air contaminant.

While the operational-related activities are simultaneously expected to reduce emissions of NOx and increase emissions of greenhouse gases (GHG) or toxic air contaminants resulting from

ammonia slip associated with the operation of SCR equipment, the construction-related activities are expected to generate emissions from worker vehicles, trucks, and construction equipment. Thus, the air quality impacts associated with the construction and operational phases of the proposed project are potentially significant and will be evaluated in the Draft EA.

III. c) The anticipated NOx emission reductions that would result from implementing PAR 1146 are expected to improve the overall air quality in the Basin by enhancing the probability of attaining and maintaining state and national ambient air quality standards for ozone, PM10, and PM2.5. However, the cumulative secondary impacts associated with reducing NOx have the potential for creating significant adverse project-specific air quality impacts that will be evaluated in the Draft EA

III. d) Emission sources associated with the construction-related activities as a result of implementing the proposed project may temporarily emit air contaminants. Further, emissions sources associated with the operational-related activities as a result of implementing the proposed project may emit a toxic air contaminant, ammonia, as ammonia slip. The impact of these emissions on sensitive populations, including individuals at hospitals, nursing facilities, daycare centers, schools, and elderly intensive care facilities, as well as residential and off-site occupational areas, will be evaluated in the Draft EA

III. e) The proposed project is not expected to create significant objectionable odors, either during construction or during operations. Specific to the installation of SCR equipment for various affected facilities, ammonia will be employed and it can have a strong odor. Nonetheless, the proposed project is not expected to generate substantial ammonia odors, since the affected facilities utilizing SCR technology will likely employ aqueous ammonia which will need to be stored in enclosed pressurized tanks.

Injection of ammonia into the flue gas often requires more ammonia than is necessary to achieve the desired NOx reduction. Unreacted ammonia passes or "slips" through the SCR reactor vessel and is released to the atmosphere, which is referred to as ammonia slip. Under normal operating and permitted conditions, ammonia slip is approximately five to 10 ppm. Because exhaust gases are hot, any ammonia slip emissions 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 and 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. Further, permits for installing SCR equipment will be subject to conditions that would specifically limit the amount of ammonia slip emitted.

Affected facilities employing the SCR equipment may also consider maintaining regular surveillance efforts to minimize the frequency and magnitude of odor events. For the installation of control equipment other than SCR, the use of BARCT also reduces the emissions of compounds that could otherwise generate odors. Therefore, no significant odor impacts are expected from the proposed project.

III. f) PAR 1146 will be required to comply with all applicable SCAQMD, CARB, and EPA rules and regulations. Thus, the proposed project is not expected to diminish an existing air quality rule or future compliance requirements. Further, adopting and implementing PAR 1146 enhances existing air pollution control rules that are expected to assist the SCAQMD in its

efforts to attain and maintain with a margin of safety the state and national ambient air quality standards for NOx.

Based upon these considerations, the air quality impacts associated with increased emissions of criteria air contaminants during the construction phase and the increased emissions of toxic air contaminants during the operation phase of the proposed project will be evaluated further in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:			
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☑

Significance Criteria

Impacts on biological resources will be considered significant if any of the following criteria apply:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion

IV. a), b), c), & d) PAR 1146 would only affect units operating at existing facilities located throughout the district. All of the affected units operating at existing facilities are located in industrial, commercial and institutional areas, which have already been greatly disturbed. In general, these areas currently do not support riparian habitat, federally protected wetlands, or migratory corridors. Additionally, special status plants, animals, or natural communities are not expected to be found within close proximity to the affected facilities. Therefore, the proposed project would have no direct or indirect impacts that could adversely affect plant or animal species or the habitats on which they rely in the SCAQMD's jurisdiction. The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions. A conclusion in the Program Environmental Impact Report (EIR) for the 2007 AQMP was that population growth in the region would have greater adverse effects on plant species and wildlife dispersal or migration corridors in the basin than SCAQMD regulatory activities, (e.g., air quality control measures or regulations). The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions.

IV. e) & f) The proposed project is not envisioned to conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Additionally, the proposed project will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan, and would not create divisions in any existing communities because all activities associated with complying with PAR 1146 will occur at existing industrial, commercial and institutional facilities.

Based upon these considerations, significant biological resource impacts are not expected from the implementation of the proposed project and will not be further analyzed in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:			
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource, site, or feature?	☐	☐	☑
d)	Disturb any human remains, including those interred outside a formal cemeteries?	☐	☐	☑

Significance Criteria

Impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion

V. a) There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Since construction-related activities associated with the implementation of PAR 1146 are expected to be confined within the existing footprint of the affected facilities, no impacts to historical resources are expected to occur as a result of implementing the proposed project.

V. b), c), & d) Installing add-on controls and other associated equipment to comply with PAR 1146 will require disturbance of previously disturbed areas, i.e., existing industrial or commercial facilities. However, since construction-related activities are expected to be confined within the existing footprint of the affected facilities, PAR 1146 is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that these areas are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed. Therefore, PAR 1146 has no potential to cause a substantial adverse change to a historical or archaeological resource, directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or disturb any human remains, including those interred outside a formal cemeteries. The proposed project is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the district.

Based upon these considerations, significant cultural resources impacts are not expected from the implementation of the proposed project and will not be further analyzed in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
VI.	**ENERGY.** Would the project:			
a)	Conflict with adopted energy conservation plans?	☐	☐	☑
b)	Result in the need for new or substantially altered power or natural gas utility systems?	☐	☑	☐
c)	Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☑	☐
d)	Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☑	☐
e)	Comply with existing energy standards?	☐	☐	☑

Significance Criteria

Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Discussion

PAR 1146 would reduce emissions of NOx from various existing combustion sources at affected facilities. The expected options for compliance are either replacing burners with ultra-low NOx burners or installing add-on control equipment. Further, it is expected that the installation and operation of any equipment used to comply with PAR 1146 will also comply with all applicable existing energy standards.

VI. a) & e) PAR 1146 is not subject to any existing energy conservation plans. If a facility that is subject to PAR 1146 is also subject to energy conservation plans, it is not expected that PAR 1146 will affect in any way or interfere with that facility's ability to comply with its energy conservation plan or energy standards. Further, project construction and operation activities will not utilize non-renewable resources in a wasteful or inefficient manner.

VI. b), c) & d. Installation of SCR equipment to comply with PAR 1146 increases demand for energy used for operating pumps, fans, controllers, etc. Specifically, increased energy demand

from the SCR and associated equipment at full load is approximately 0.7 percent, according to a 1988 SCR demonstration project performed by Southern California Edison. At low loads, demands increased by up to seven percent, but vendors contacted by SCAQMD staff at the time indicated that the 0.7 percent increase in energy demand was more accurate. Any additional electricity required is typically either supplied by each affected facility's cogeneration units or by the local electrical utility, as appropriate, so it is not anticipated that new or substantially altered power utility systems will need to be built to accommodate any additional electricity demands created by the proposed project. No increase in natural gas use is expected for operations subject to the proposed project. Use of ultra-low NOx burners is expected to be a more efficient combustion option than continued use of existing burners, which could potentially reduce demand for natural gas at affected facilities.

Based upon these considerations, significant adverse impacts to energy are not expected from implementation of PAR 1146 and will not be evaluated further in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS. Would the project:			
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			
• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☑
• Strong seismic ground shaking?	☐	☐	☑
• Seismic–related ground failure, including liquefaction?	☐	☐	☑
• Landslides?	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☑

Significance Criteria

Impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion

VII. a) Since PAR 1146 would result in construction activities in industrial, commercial, or institutional settings to replace burners with ultra-low NOx burners or to install control equipment, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. Southern California is an area of known seismic activity. Accordingly, the installation of add-on controls at existing affected facilities to comply with PAR 1146 is expected to conform with the Uniform Building Code and all other applicable state and local building codes. As part of the issuance of building permits, local jurisdictions are responsible for assuring that the Uniform Building Code is adhered to and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation condition at the site. The Uniform Building Code requirements also consider liquefaction potential and establish stringent requirements for building foundations in areas potentially subject to liquefaction. Thus, PAR 1146 would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated and will not be further analyzed in the Draft EA.

VII. b) Since add-on controls will likely be installed at existing facilities, during construction of the proposed project, a slight possibility exists for temporary erosion resulting from excavating and grading activities, if required. These activities are expected to be minor since the existing facilities are generally flat and have previously been graded. Further, wind erosion is not

expected to occur to any appreciable extent, because operators at dust generating sites would be required to comply with the best available control measure (BACM) requirements of SCAQMD Rule 403 – Fugitive Dust. In general, operators must control fugitive dust through a number of soil stabilizing measures such as watering the site, using chemical soil stabilizers, revegetating inactive sites, etc. The proposed project involves the installation or modification of add-on control equipment for combustion sources at existing facilities, so that grading could be required to provide stable foundations. Potential air quality impacts related to grading are addressed elsewhere in this Initial Study. No unstable earth conditions or changes in geologic substructures are expected to result from implementing PAR 1146.

VII. c) Since the proposed project will affect existing facilities, it is expected that the soil types present at the affected facilities will not be further susceptible to expansion or liquefaction. Furthermore, subsidence is not anticipated to be a problem since only minor excavation, grading, or filling activities are expected occur at affected facilities. Additionally, the affected areas are not envisioned to be prone to new landslide impacts or have unique geologic features since the affected equipment units are located at existing facilities that are typically in industrial, commercial and institutional areas.

VII. d) & e) Since PAR 1146 will affect equipment units at existing facilities located in industrial, commercial or institutional zones, it is expected that people or property will not be exposed to new impacts related to expansive soils or soils incapable of supporting water disposal. Further, typically each affected facility has some degree of existing wastewater treatment systems that will continue to be used and are expected to be unaffected by PAR 1146. Sewer systems are available to handle wastewater produced and treated by each affected facility. Each existing facility affected by PAR 1146 does not require installation of septic tanks or alternative wastewater disposal systems. As a result, PAR 1146 will not require operators to utilize septic systems or alternative wastewater disposal systems. Thus, implementation of PAR 1146 will not adversely affect soils associated with a septic system or alternative wastewater disposal system.

Based upon these considerations, significant geology and soils impacts are not expected from the implementation of PAR 1146 and will not be further analyzed in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:			
a)	Create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials?	☑	☐	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset conditions involving the release of hazardous materials into the environment?	☑	☐	☐

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☑	☐	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☑	☐
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☑	☐
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☑
i)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☑

Significance Criteria

Impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Discussion

VIII. a) & b) New air pollution control equipment (e.g., SCRs) 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 (e.g. ammonia) used by the control equipment. In addition,

the shipping, handling, storing, and disposing of hazardous materials inherently poses a certain risk of a release to the environment. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing PAR 1146. Further, if the control option chosen by each affected facility is SCR, PAR 1146 may alter the transportation modes for ammonia feedstock to/from the existing facilities.

For these reasons, implementation of PAR 1146 may alter the hazards associated with the existing affected facilities. At many of the affected facilities, a number of hazardous materials are currently in use. In general, the major types of public safety risks evaluated consist of impacts resulting from toxic substance releases, fires, and explosions. Fire and explosion risks are not expected to be associated with PAR 1146.

Exposure to a toxic gas cloud is the potential hazard associated with SCR control equipment. A toxic gas cloud is the release of a volatile chemical such as anhydrous ammonia that could form a cloud and migrate off-site, thus exposing individuals. Anhydrous ammonia is heavier than air such that when released into the atmosphere, would form a cloud at ground level rather than be dispersed. "Worst-case" conditions tend to arise when very low wind speeds coincide with the accidental release, which can allow the chemicals to accumulate rather than disperse. Current SCAQMD policy no longer allows the use of anhydrous ammonia for air pollution control. Instead aqueous ammonia, 19 percent by volume is typically required as a permit condition associated with the installation of SCR equipment. As a result, hazards from toxic clouds are not expected to be associated with PAR 1146.

Hazards Due to Transport of Ammonia

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, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality and some accidents result in little or no property damage or personal injury. Additionally, not every truck accident is expected to result in an explosion or a release of hazardous substances.

Every time hazardous materials are moved from the site of generation, there is the potential for accidental 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 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 rates presented in Table 2-2 (Los Angeles County, 1988). As shown in Table 2-2, the probability of an accidental release of ammonia during transport is extremely small.

Table 2-2
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.
* Average number for transport on interstates, highways, and urban roadways.

In addition to considering the probability of an accidental release, it is necessary to consider the consequences of an accidental release during transport. The 2004 Final EA for Regulation XX – RECLAIM evaluated specific hazards due to transport of aqueous ammonia to several local refineries. The 2004 Final EA concluded that in the unlikely even that a tanker truck would rupture and release the entire 7,000 gallon capacity 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 surface 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 (SCAQMD, 2004).

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 the hazard analysis in the 2004 Final EA was that potential impacts due to an accidental release of aqueous ammonia during transportation are less than significant. It should be noted that the analysis in the 2004 Final EA is based on tanker trucks transporting aqueous ammonia in concentrations less than 19 percent by volume, which is consistent with SCAQMD permitting policy to limit the ammonia concentration to this level. For these reasons, the transportation of ammonia as a result of complying with PAR 1146 is not expected to be a significant hazards impact.

Hazards Due to Other Types of Accidental Releases of Ammonia

Another type of accidental release of ammonia could occur on-site at the facility is the ammonia storage tank ruptures. Whatever the size the storage tank will be, storage tanks constructed at affected facilities would also need to be surrounded by some form of secondary containment such as a dyke or berm. These same containment areas would also be required at truck loading racks to contain ammonia in the event of a spill during truck unloading activities. An accidental release of aqueous ammonia and subsequent evaporation of the released ammonia at the site of the facility would be captured in containment dykes or berms and, depending on the distance to the nearest receptor, could result in exposure to ammonia concentrations that exceed the SCAQMD's significant concentration level. Therefore, a potential hazards impacts related to an accidental release of aqueous ammonia at a facility as a result of implementing the proposed project are potentially significant and will be addressed in the Draft EA.

VIII. c) Some affected facilities may be located within one-quarter mile of a sensitive receptor (e.g., a day care center). Therefore, a potential for significant impacts from hazardous emissions or the handling of acutely hazardous materials, substances and wastes near sensitive-receptors may occur and will be addressed in the Draft EA.

VIII. d) Government Code §65962.5 refers to hazardous waste handling practices at facilities subject to the Resources Conservation and Recovery Act (RCRA). Construction activities associated with implementing PAR 1146 will occur within the confines of the existing affected facilities. Some of the affected facilities may be included on the list of the hazardous materials sites compiled pursuant to Government Code §65962.5. Hazardous wastes from these existing facilities are managed in accordance with applicable federal, state, and local rules and regulations. The types of additional waste expected to be generated from implementing PAR 1146 will consist primarily of additional catalyst used by the new SCR control devices. For those affected facilities which already use catalyst for other operational activities on-site, the additional collected spent catalyst will continue to be handled in the same manner as currently handled such that it will be disposed/recycled at approved facilities. Further, for the other affected facilities which are new to handling the catalyst waste, the same disposal/recycling procedures are expected to be followed. Accordingly, significant hazards impacts from the disposal/recycling of hazardous materials are not expected and will not be further analyzed in the Draft EA.

VIII. e) & f) Construction activities from implementing PAR 1146 are expected to occur within the existing confines of the affected facilities. However, some of these facilities may be located within two miles of an airport (either public or private) and are located within an airport land use plan. Nonetheless, the installation of SCR control devices is expected to be constructed according to the all appropriate building, land use and fire codes and operated at a low enough height relative to existing flight patterns so that the structure would not interfere with plane flight paths. Such codes are designed to protect the public from hazards associated with normal operation. Therefore, PAR 1146 is not expected to result in a safety hazard for people residing or working in the area of the affected facilities even within the vicinity of an airport and as such, will not be further analyzed in the Draft EA.

VIII. g) Emergency response plans are typically prepared in coordination with the local city or county emergency plans to ensure the safety of not only the public (surrounding local communities), but the facility employees as well. PAR 1146 would not impair implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan. Any existing commercial, institutional or industrial facilities affected by PAR 1146 would typically already have their own emergency response plans in place. However, for those operators of affected facilities who elect to install SCR units may need to update their emergency response plan to reflect the new or increased use of ammonia on-site. Thus, PAR 1146 is not expected to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan and as such, will not be further analyzed in the Draft EA.

VIII. h) & i) The Uniform Fire Code and Uniform Building Code set standards intended to minimize risks from flammable or otherwise hazardous materials. Local jurisdictions are required to adopt the uniform codes or comparable regulations. Local fire agencies require permits for the use or storage of hazardous materials and permit modifications for proposed

increases in their use. Permit conditions depend on the type and quantity of the hazardous materials at the facility. Permit conditions may include, but are not limited to, specifications for sprinkler systems, electrical systems, ventilation, and containment. The fire departments make annual business inspections to ensure compliance with permit conditions and other appropriate regulations. Further, businesses are required to report increases in the storage or use of flammable and otherwise hazardous materials to local fire departments. Local fire departments ensure that adequate permit conditions are in place to protect against potential risk of upset.

PAR 1146 will not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees. Additional natural gas may be used during the construction phase of the proposed project. Natural gas is currently used at several of the affected facilities. The hazards associated with natural gas would result in a torch fire in the event that a release occurred and caught fire. Because of the locations of each facility that would be affected by PAR 1146, a torch fire would be expected to remain on-site so that there would be no public exposure to the fire hazards. No substantial or native vegetation typically exists on or near the affected facilities (specifically because they could be a fire hazard) so PAR 1146 is not expected to expose people or structures to wild fires. Therefore, no significant increase in fire hazards are expected any of the affected facilities associated with implementing PAR 1146.

Based on these considerations, the potential hazards impacts related to the operations at each affected facility and the transport of hazardous materials associated with PAR 1146 will be addressed in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
IX.	**HYDROLOGY AND WATER QUALITY.** Would the project:			
a)	Violate any water quality standards or waste discharge requirements?	☐	☑	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☑	☐

		Potentially Significant Impact	Less Than Significant Impact	No Impact
d)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☑	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☑	☐
f)	Otherwise substantially degrade water quality?	☐	☐	☑
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☑
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flaws?	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☑
k)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☑	☐
l)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☑	☐
m)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☑	☐
n)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑

	Potentially Significant Impact	Less Than Significant Impact	No Impact
o) Require in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☑	☐

Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.
- The project increases demand for water by more than five million gallons per day.

Discussion

IX. a), f), k), l) & o) Operators of facilities affected by PAR 1146 are expected to install new air pollution control equipment, such as SCR and replace existing burners with ultra-low NOx burners. However, no additional water demand or wastewater generation results from the operation of SCR systems or ultra-low NOx burners at stationary sources because these control technologies do not entail the use of water in the NOx control process. Construction activities associated with PAR 1146 may require the use of water as a dust suppressant if grading is required. However, the installation of these types of air pollution control equipment at existing facilities is not expected to require much, if any, additional grading. Other than possible grading for installing ammonia storage tanks as part of the installation of SCR units, most of the modifications would occur to the existing equipment (i.e., adding burners and flue gas ductwork). Initial estimates show that approximately eight facilities may choose to install SCR units and ammonia storage tanks. For a worst-case analysis, if all of these facilities require grading of one acre or less on an existing site, one 6,000 gallon capacity water truck per day per facility can be assumed as sufficient for dust control. Thus, the maximum amount of water which could potentially be used for dust control during construction would be 48,000 gallons per day. Therefore, implementation of PAR 1146 does not increase demand for water by more than

significance threshold of 5,000,000 gallons per day. In fact, a relatively minimal amount of water, if at all, is expected to be used for this purpose. Additionally, water used for dust suppression does not have to be of potable quality, but can be reclaimed water. Reclaimed water is currently available in many areas of the SCAQMD's jurisdiction. Thus, the impacts of PAR 1146 on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant.

IX. b) Implementation of PAR 1146 is not expected to significantly adversely affect the quantity or quality of groundwater in the area of each affected facility. No significant adverse impacts are expected to ground water quality from PAR 1146 because: 1) wastewater will continue to be collected and treated in each of the affected facility's wastewater treatment systems or in compliance with the current wastewater discharge permits, as applicable; 2) no underground storage tanks are expected to be constructed as part of PAR 1146; 3) containment berms will be required or may already exist around the new or modified units to minimize the potential for an ammonia spill to contaminate soil and groundwater; and, 4) any new storage tanks that may be proposed will be required to comply with BACT and other safety requirements such as double bottom and monitoring requirements.

IX. c), d), e) & m) Changes to each affected facility's storm water collection systems are expected to be less than significant since most of the changes will occur within existing units (i.e., replacing burners with ultra-low NOx burners or installing SCR control equipment). Further, typically most of the areas likely to be affected by PAR 1146 are currently paved and are expected to remain paved. Any new units constructed will be curbed and the existing units will remain curbed to contain any runoff. Any runoff occurring will continue to be handled by each affected facility's wastewater system and sent to an on-site wastewater treatment system prior to discharge. The surface water runoff is expected to be handled with each facility's current wastewater treatment system. Storm water runoff will be collected and discharged in accordance with each facility's discharge permit terms and conditions.

IX. g), h), & i) PAR 1146 is expected to involve construction and modification activities located within the confines of existing facilities and does not include the construction of any new housing so it would not place new housing within a 100-year flood hazard area. It is likely that most affected facilities are not located within a 100-year flood hazard area. Any affected facilities that may be located in a 100-year flood area could impede or redirect 100-year flood flows, but this would be considered part of the existing setting and not an effect of PAR 1146. Since PAR 1146 would not require locating new facilities within a flood zone, it is not expected that implementation of PAR 1146 would expose people or property to any known water-related flood hazards.

IX. j) PAR 1146 does not require construction of new facilities in areas that could be affected by tsunamis. Of the facilities affected by PAR 1146, some are located near the Ports of Long Beach, Los Angeles, and San Pedro. The port areas are protected from tsunamis by the construction of breakwaters. Construction of breakwaters combined with the distance of each facility from the water is expected to minimize the potential impacts of a tsunami or seiche so that no significant impacts are expected. PAR 1146 does not require construction of facilities in areas that are susceptible to mudflows (e.g., hillside or slope areas). Existing affected facilities that are currently located on hillsides or slope areas may be susceptible to mudflow, but this

would be considered part of the existing setting. As a result, PAR 1146 is not expected to generate significant adverse mudflow impacts.

IX. n) Each affected facility is expected to have sufficient water supplies available for implementing PAR 1146. Since the type of air pollution control equipment that would be installed at affected facilities does not use water as part of the control process, and limited water demand increases may occur for dust suppression during limited grading activities, the need for new or expanded water supply entitlements is not expected. Should any additional demand for clean water arise, the increase in water demand is expected to be within the available water supply for each affected facility as indicated by the MWD projections.

While it is not possible to predict water availability in the future, existing entitlements and resources in the district provide sufficient water supplies that currently exceed demand. According to the Metropolitan Water District (MWD), the largest supplier of water to California, MWD expects to be able to meet 100 percent of its member agencies' water needs for the next ten years, even during times of critical drought. MWD and its member agencies have identified and are implementing programs and projects to assure continued reliable water supplies for at least the next 20 years. MWD is expected to continue providing a reliable water supply through developing a portfolio of diversified water sources that includes: cooperative conservation; water recycling; and groundwater storage, recovery, and replenishment programs. Other additional water supplies will be supplied in the future as a result of water transfer from other water agencies, desalination projects and state and federal water initiatives, such as CALFED and California's Colorado River Water Use Plan. (Metropolitan Water District Annual Progress Report to the California's State Legislature, February 2002.)

Based upon these considerations, the potential hydrology and water quality impacts, especially those associated with wastewater discharge, storm water discharge, and water demand are expected to be less than significant and will not be evaluated in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING.** Would the project:			
a)	Physically divide an established community?	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑
c)	Conflict with any applicable habitat conservation or natural community conservation plan?	☐	☐	☑

Significance Criteria
Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by local jurisdictions.

Discussion
X. a) PAR 1146 does not require construction of new facilities, but any physical effects will occur at existing facilities and, thus, implementing PAR 1146 will not result in physically dividing any established communities.

X. b) & c) There are no provisions in PAR 1146 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by PAR 1146. Further, PAR 1146 would be consistent with the typical industrial, commercial, and institutional zoning of the affected facilities. Typically, all proposed construction activities are expected to occur within the confines of the existing facilities. PAR 1146 would not affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities. Further, no new development or alterations to existing land designations will occur as a result of the implementation of PAR 1146. Therefore, present or planned land uses in the region will not be affected as a result of PAR 1146.

Based upon these considerations, significant land use planning impacts are not expected from the implementation of PAR 1146, and thus, will not be further analyzed in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES. Would the project:			
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☑

Significance Criteria
Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:
- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion
XI. a) & b) There are no provisions in PAR 1146 that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state such as aggregate, coal, clay, shale, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Based upon these considerations, significant mineral resource impacts are not expected from the implementation of PAR 1146, and thus, will not be further analyzed in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:			
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☑	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☑	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☑	☐
f)	For a project within the vicinity of a private airship, would the project expose people residing or working in the project area to excessive noise levels?	☐	☑	☐

Significance Criteria
Impacts on noise will be considered significant if:
- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant

if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion

XII. a), b), c), & d) Modifications or changes associated with the implementation of PAR 1146 will take place at existing facilities that are located in industrial, commercial and institutional settings. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. Construction activities associated with implementing PAR 1146 may generate some noise associated with the use of construction equipment and construction-related traffic in the event that grading for the installation of new ammonia tanks, fore example, is necessary. However, noise from the proposed project is not expected to produce noise in excess of current operations at each of the existing facilities. If SCR control devices are installed, the operations phase of PAR 1146 implementation may add new sources of noise to each affected facility. However, it is expected that each facility affected will comply with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. These potential noise increases are expected to be small, if at all, and thus less than significant. Therefore, potential noise impacts will not be further evaluated in the Draft EA.

XII. e) & f) Though some of the facilities affected by PAR 1146 are located at sites within an airport land use plan, or within two miles of a public airport, the addition of SCR control equipment would not expose people residing or working in the project area to the same degree of excessive noise levels associated with airplanes. All noise producing equipment must comply with local noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements.

Based upon these considerations, significant noise impacts are not expected from the implementation of PAR 1146 and will not be further analyzed in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:			
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☑
c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

Significance Criteria

Impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion

XIII. a) Minor construction activities associated with PAR 1146 at each affected facility are not expected to involve the relocation of individuals, require new housing or commercial facilities, or change the distribution of the population. The reason for this conclusion is that operators of affected facilities who need to perform any construction activities to comply with PAR 1146 can draw from the existing labor pool in the local southern California area. Further, it is not expected that replacing existing burners with new ultra-low NOx burners or installing air pollution control equipment will require new employees during operation of the equipment. In the event that new employees are hired, it is expected that the number of new employees at any one facility would be small. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing PAR 1146. As a result, PAR 1146 is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth in the district or population distribution.

XIII. b) & c) Because PAR 1146 includes modifications and/or changes at existing facilities located in industrial, commercial and institutional settings, PAR 1146 is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the district.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of PAR 1146 and will not be further evaluated in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:			
a) Fire protection?	☐	☐	☑
b) Police protection?	☐	☐	☑
c) Schools?	☐	☐	☑
d) Parks?	☐	☐	☑
e) Other public facilities?	☐	☐	☑

Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion

XIV. a) & b) Implementation of PAR 1146 by replacing existing burners with ultra-low NOx burners or installing SCR control devices is anticipated to continue current operations at existing affected facilities. PAR 1146 may result in greater demand for ammonia, which will need to be transported to the affected facilities that install SCR and stored onsite prior to use. In the event of an accidental release fire departments are typically first responders for control and clean-up and police may be need to be available to maintain perimeter boundaries. Further, based on the low probability of accidents occurring, as shown in Table 2-2, PAR 1146 is not expected to increase the need or demand for additional public services (e.g., fire departments, police departments, schools, parks, government, et cetera) above current levels.

XIV. c) & d) As noted in the previous "Population and Housing" discussion, PAR 1146 is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at affected facilities and operation of new SCR control equipment is not expected to require additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

XIV. e) PAR 1146 is expected to result in the use of new add-on control equipment (SCR control devices). Besides permitting the equipment or altering permit conditions by the SCAQMD, there is no need for other types of government services. PAR 1146 would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population and, therefore, no need for physically altered government facilities.

Based upon these considerations, significant public services impacts are not expected from the implementation of PAR 1146 and will not be further evaluated in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
a) **RECREATION.**			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☑

Significance Criteria

Impacts to recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely effects existing recreational opportunities.

Discussion

XV. a) & b) As discussed previously under "Land Use," there are no provisions in PAR 1146 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments; no land use or planning requirements will be altered by the proposed project. Further, PAR 1146 would not increase the use of existing neighborhood and regional parks or other recreational facilities or include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment because PAR 1146 is not expected to induce population growth.

Based upon these considerations, significant public services impacts are not expected from the implementation of PAR 1146 and will not be further evaluated in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVI. SOLID/HAZARDOUS WASTE. Would the project:			
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☑	☐

Significance Criteria

The proposed project impacts on solid/hazardous waste will be considered significant if the following occurs:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion

XVI. a) PAR 1146 is expected to slightly increase the quantity of waste generated at the affected facilities that replace existing burners with ultra-low NOx burners and install new SCR units. The waste is associated with solid materials from construction activities associated with any air pollution control equipment or other related components being replaced, as applicable, and spent catalysts generated from SCR units expected to be installed at eight facilities, and may result in a relatively slight, incremental increase in the total waste generated by each affected facility.

Solid or hazardous wastes generated from construction-related activities would consist primarily of materials from the demolition of existing air pollution control equipment and construction associated with new air pollution control equipment. Construction-related waste would be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 48 Class II/Class III landfills within the SCAQMD's jurisdiction. The estimated total capacity of these landfills is approximately 111,198 tons per day (SCAQMD, 2000).

However, it is expected that some affected facilities will address the increase in waste through existing waste minimization plans. In addition, other affected facilities that have existing catalyst-based operations currently regenerate, reclaim or recycle the catalysts, in lieu of disposal. Moreover, due to the heavy metal content and its relatively high cost, catalyst recycling can be a lucrative choice.

Depending on operating conditions, it is expected that spent catalysts would be reclaimed and recycled approximately every five years, the typical life-span of catalysts used in SCR applications, though it is possible that spent catalysts could be disposed of. The composition of the catalyst will determine in which type of landfill a catalyst would be disposed. There are two main types of catalysts: one in which the catalyst is coated onto a metal structure and a ceramic-based catalyst onto which the catalyst components are calcified.

Catalysts with a metal structure would not normally be considered a hazardous waste. Instead, it would be considered a metal waste, like copper pipes, and, therefore, would not be a regulated waste requiring disposal in a Class I landfill unless it is friable or brittle. Ceramic-based catalysts are not considered friable or brittle because they typically include a fiber binding material in the catalyst material. In both cases, spent catalyst would not require disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill.

Based on the preceding discussion, it is likely that spent catalysts would be considered a "designated waste," which is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state (California Code of Regulations, Title 23, Chapter 3 Subparagraph 2522(a)(1)). Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. According to the Program EIR for the 2007 AQMP (SCAQMD, 2007), total Class III landfill waste disposal capacity in the district is approximately 97,269 tons per day, many of which have liners and can handle Class II and Class III wastes.

Disposal of spent catalyst would typically involve crushing the material and encasing it in concrete prior to disposal. Since it is expected that most spent catalysts will be recycled and regenerated, it is anticipated that there will be sufficient landfill capacity in the district to accommodate disposal of any spent catalyst materials. Thus, the potential increase of solid waste generated by the air pollution control equipment operated at eight of the affected facilities that are expected to install SCR as a result of PAR 1146 may not necessarily be disposed of and, therefore, is not expected to exceed the capacity of designated landfills available to each affected facility.

XVI. b) Implementing PAR 1146 is not expected to hinder in any way any affected facility's ability to comply with existing federal, state, and local regulations related to solid and hazardous wastes.

Based upon these considerations, significant solid/hazardous waste impacts are not expected from the implementation of PAR 1146 and will not be further evaluated in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION/TRAFFIC. Would the project:			
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☑	☐

		Potentially Significant Impact	Less Than Significant Impact	No Impact
b)	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☑	☐
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☑	☐
d)	Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☑
e)	Result in inadequate emergency access?	☐	☐	☑
f)	Result in inadequate parking capacity?	☐	☑	☐
g)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☑	☐

Significance Criteria

Impacts on transportation/traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day
- Increase customer traffic by more than 700 visits per day.

Discussion

XVII. a) & b) Construction activities resulting from implementing PAR 1146 may generate a slight, albeit temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, PAR 1146 is not expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities because a small number of construction workers are expected to work at any one facility. Also, PAR 1146 is not expected to exceed, either individually or cumulatively, the current level of service of

the areas surrounding the affected facilities. The work force at each affected facility is not expected to significantly increase as a result of PAR 1146 and operation-related traffic is expected to be minimal. Thus, the traffic impacts will not be evaluated further in the Draft EA.

XVII. c) Though some of the facilities that will be affected by PAR 1146 are located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, actions that would be taken to comply with PAR 1146, such as installing SCR control equipment, are not expected to significantly influence or affect air traffic patterns. Further, the size and type of air pollution control devices that would be installed would not be expected to affect navigable air space. Thus, PAR 1146 would not result in a change in air traffic patterns including an increase in traffic levels or a change in location that results in substantial safety risks.

XVII. d) & e) The siting of each affected facility is consistent with surrounding land uses and traffic/circulation in the surrounding areas of the affected facilities. Thus, PAR 1146 is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities. Aside from the temporary effects due to a slight increase in truck traffic for those facilities that will undergo construction activities during installation of air pollution control equipment, PAR 1146 is not expected to alter the existing long-term circulation patterns. PAR 1146 is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur. Further, PAR 1146 does not involve construction of any roadways, so there would be no increase in roadway design feature that could increase traffic hazards. Emergency access at each affected facility is not expected to be impacted by PAR 1146. Further, each affected facility is expected to continue to maintain their existing emergency access gates.

XVII. f) Each affected facility will be required to provide parking for the construction workers, as applicable, either on or within close proximity to each facility. No additional parking will be needed after completion of the construction phase because the work force at each facility is not expected to significantly increase as a result of implementing PAR 1146.

XVII. g) Construction and operation activities resulting from implementing PAR 1146 are not expected to conflict with policies supporting alternative transportation since PAR 1146 does not involve or affect alternative transportation modes (e.g. bicycles or buses) because the construction and operation activities related to PAR 1146 will occur solely in existing industrial, commercial, and institutional areas.

Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of PAR 1146 and will not be further evaluated in the Draft EA.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.			
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☑
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☑	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☑	☐	☐

Discussion

XVIII. a) PAR 1146 is not expected to reduce or eliminate any plant or animal species or destroy prehistoric records of the past. Each site affected by PAR 1146 is part of an existing facility, which has been previously graded, such that PAR 1146 is not expected to extend into environmentally sensitive areas.

XVIII. b) The Environmental Checklist indicates that PAR 1146 has potentially significant adverse impacts on air quality and hazards and hazardous materials. The potential for cumulative impacts on these resources will be evaluated in the Draft EA.

XVIII. c) PAR 1146 may result in emissions of regulated air pollutants and may also increase the hazards at some of the affected facilities. The potential for these impacts to have adverse impacts on human beings, either directly or indirectly, will be evaluated in the Draft EA.

A P P E N D I X A (of the Initial Study)

P R O P O S E D A M E N D E D R U L E 1 1 4 6

In order to save space and avoid repetition, please refer to the latest version of proposed amended Rule 1146 located elsewhere in Appendix A of the Draft EA. The January 29, 2008 version of the proposed amended rule was circulated with the Notice of Preparation/Initial Study (NOP/IS) that was released on January 31, 2008 for a 30-day public review and comment period ending February 29, 2008.

Original hard copies of the NOP/IS, which include the version of the proposed amended rule listed above, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-2039.

APPENDIX D

COMMENT LETTER ON THE NOP/INITIAL STUDY AND RESPONSES TO COMMENTS

Comment Letter #1

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

February 28, 2008
File No.: 31B-380.10B

Ms. Barbara Radlein
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765

Dear Ms. Radlein:

Comments on Initial Study and Notice of Preparation of Draft Environmental Assessment for Proposed Amended Rule 1146

The Sanitation Districts of Los Angeles County (Sanitation Districts) appreciate the opportunity to comment on the Initial Study (IS) and Notice of Preparation (NOP) of a Draft Environmental Assessment (EA) for Proposed Amended Rule 1146 (PAR 1146). The Sanitation Districts are a confederation of 24 independent sanitation districts serving about 5.2 million people in Los Angeles County. Our sewerage service area is approximately 800 square miles and encompasses 78 cities and unincorporated county territory. Our facilities include eleven wastewater treatment plants, three active sanitary landfills, and three inactive landfills. We operate a number of boilers fired on digester gas, landfill gas, or natural gas that are subject to Rule 1146. These boilers provide a means to utilize valuable renewable energy while generating essential plant heating and electrical energy. As such they play an integral role in our mission to provide environmentally sound, cost effective wastewater and solid waste management.

This letter provides comments on the IS/NOP as well as latest PAR 1146 language dated January 29, 2008. The comments on rule language supplement our letter submitted on December 28, 2007. *Our primary concerns, listed below, are limited to air quality impacts in the EA and to proposed source testing restrictions within PAR 1146.* Full details of these and other minor comments are provided herein.

- Regarding compliance determinations in PAR 1146, prohibiting boiler tuning for one month or 250 hours prior to a source test is overly restrictive. We suggest a shorter period such as one week, and to allow immediate correction, reporting and retesting for any failed tests (see Section 2 below). 1-1
- On EA air quality impacts, we ask that more consideration be given to loss of efficiency, increased operational burden, and greenhouse gases (GHG) resulting from burner retrofits (see Section 4). 1-2

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(1) Project Objective

The IS does not seem to capture the objectives of PAR 1146. While the primary objectives given on pages 1-4 and 2-2 are consistent with latest rule language, we question the secondary objectives such as "1) establish annual tune-up procedures and monthly maintenance procedures," and "3) allowing a 30 ppm NOx compliance limit for low fuel usage equipment until burner replacement but no later than a 15-year equipment life." In PAR 1146, we find no new procedures for boiler tuning and maintenance. Attachment 1 of the current rule provides a methodology for optimizing nitrogen oxides (NOx) and carbon monoxide (CO) in both forced-draft and natural draft-boilers; this is unchanged from the existing rule. Similarly, we do not find the concept of "15-years useful life" for an existing boiler in the latest PAR 1146. On the contrary, PAR 1146 (e)(4) states for low-use boilers that 30 ppm NOx must be achieved "by January 1, 2015 or during burner replacement, whichever occurs later." 1-3

(2) Project Description / Compliance Testing

Page 1-5 of the IS states under "Compliance Determination" the following: "Requirements for operators to conduct an emissions compliance determination at least every 250 hours or 30 days subsequent to the tuning or servicing of a unit are added." We are puzzled by this interpretation of the PAR 1146 (d)(2). Our understanding of the new language is that tuning prior to a compliance test is no longer allowed, with the moratorium on adjustments being 250 operating hours or 30 days prior to formal tests. The proposed change is not mandating compliance determinations every 250 hours or 30 days after a tuning event, as the IS language suggests. 1-4

Further on this issue, PAR 1146 (d)(2) can be revised to clarify intent, improve enforceability, and reduce potential emissions. Specifically, a rewording of the second sentence in subparagraph (d)(2) is suggested to clarify that tests are not required after every tuning. As to servicing, it is unclear what is restricted before testing, thus hindering enforceability. It is also unjustified since boiler servicing---scheduled or not—may not affect emissions, and tuning will be conducted if it does. Regarding pretest periods, we request that recently amended Rule 1110.2 (f)(1)(C)(ii) language be used, specifically, 40 operating hours or one week after tuning. One week is sufficient since faulty burner controls should manifest itself within that time. Further, as stated in our December 28, 2007 letter, we request that an exceedance found during source testing be *corrected, reported, and testing resumed*. This allowance would alleviate the logistical difficulties and burdensome cost of aborting a test and retesting later. Having crews return on another day would also increase vehicular emissions of criteria pollutants, diesel particulates, and greenhouse gases. In summary, we suggest the following revisions to PAR 1146 (d)(2): 1-5

(2) All emission determinations shall be made in the as-found operating condition, except no compliance determinations shall be established during start-up, shutdown, or under breakdown conditions. ~~*An emission determination 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.*~~ *No compliance determinations shall be conducted on any unit within 40 operating hours or one week after boiler tuning, whichever is later. If an emission exceedance is found during a source test, the operator shall correct the exceedance and testing may be immediately resumed, with both sets of data reported.*

Separately, page 1-5 of the IS under "Compliance Determination" seems to contain an error on the use of portable analyzers. PAR 1146 allows the use of portable analyzers per EPA Conditional Test Method 030 (CTM-030) on a monthly basis for compliance determinations in lieu of annual Method 100.1 tests. The proposed rule does not require monthly portable emission checks on all boilers subject to Rule 1146. 1-6

Lastly, under "Compliance Schedule," the concept of "enhanced compliance option" is mis-characterized. As written, the second paragraph on page 1-6 reads: "Standard and enhanced compliance dates are provided because equipment type and operation may make it difficult for a unit to comply with the enhanced option on a continuous basis. Consequently, the standard compliance dates option is also provided to allow the unit to achieve compliance with a less stringent limit but on a more aggressive implementation schedule." Our understanding of the intent of the "enhanced option" is to require additional NOx reductions in return for more time; that is, stricter limits for delayed compliance. 1-7

(3) Technology Description

The Sanitation Districts find the discussion about low-NOx burners and selective catalytic reduction (SCR) to be generally acceptable, but some of the section may not be technically accurate. For example, SCR retrofits do not always require booster fans and new stacks. Similarly, the reaction of NOx with ammonia and oxygen in the presence of the catalyst is improperly discussed with catalyst being a reactant. 1-8

(4) Air Quality Impact

The discussion on low-NOx burners on page 2-8 anticipates "relatively straightforward" low-NOx burner retrofits and "no or minimal secondary construction impacts activities." We question this simple assessment, as case-specific factors can make burner retrofits difficult and costly. Some ultra low-NOx burners with sintered metal elements require more fuel pressure than conventional burners. Biogas boiler retrofits will need additional fuel treatment to remove contaminants and moisture, resulting in added pressure drop. If warranted, natural gas boosters or compressors represent additional parasitic load, which reduces boiler efficiency and increases operational burden. Some burners also require more space outside of the boiler, which may physically interfere with plant equipment or structures. Thus depending on fuel systems requirements and burner design, existing units may not be straightforward to retrofit. Further, this assumes that existing units can be retrofitted. If that proves to be false due to technological infeasibility or space constraints, PAR 1146 would trigger entire boiler replacements, including steam side replacements and civil/structural rework. Potentially significant construction-related emissions as well as costs would result. We feel that these construction emissions should be assessed as an air quality impact. 1-9

As stated in our December 28, 2007 letter to Mr. Gary Quinn, a concern we have about lower NOx limits is the tradeoff that may occur with CO emissions and boiler efficiency. Many low-NOx burners operate successfully at the expense of increased CO emissions, which represent an increase in combustion losses. Hence more fuel is required to meet the same process heat requirement, and this translates into higher carbon dioxide emissions. While the fuel penalty and increase in emissions may be small on a per unit basis, the cumulative impact of 1000+ units affected by PAR 1146 may be significant. We request that the EA include an evaluation of increased CO and the GHG from PAR 1146. 1-10

We again express appreciation for the opportunity to comment on the IS/NOP for PAR 1146. If you should have any questions regarding this transmittal, please do not hesitate to contact Mr. Tom Fang at (562) 908-4288, extension 2132.

Very truly yours,

Stephen R. Maguin

Gregory M. Adams

Gregory M. Adams
Assistant Departmental Engineer
Air Quality Engineering Section
Technical Services Department

GMA:TCF:bb

cc: Mr. Gary Quinn, SCAQMD
Mr. Joe Cassmassi, SCAQMD
Mr. Laki Tisopulos, SCAQMD

Responses to Comment Letter #1
(County Sanitation Districts of Los Angeles County, February 28, 2008)

1-1 District staff has proposed emission determinations to be conducted at least 250 operating hours, or at least thirty days subsequent to the tuning or servicing of any unit. This time period was established in order to provide safeguards that the unit will be tested as close as practical to actual operational conditions. Based on District field experience, the one week period, as suggested by the commentator, is not an adequate time period to reflect actual operational conditions for the entire universe of Rule 1146 units. In recognition of events outside the owner or operator's control, staff has added language in the rule for conducting unscheduled repairs during this time period. PAR 1146 has also been revised to allow the owner or operator 72 hours to correct any problems that resulted in a non-compliance status.

1-2 Loss of fuel efficiency would result in an increase in greenhouse gas emissions. According to ultra-low NOx burner vendors and installers, there may be a marginal loss in fuel efficiency which may result in an increase of approximately one to two percent in fuel usage with these burners. In the Air Quality section of the Draft EA, the loss in fuel efficiency and the corresponding increase in greenhouse gas emissions has been estimated and analyzed. Any increase in operational burden will be part of the cost-effectiveness analysis presented in the staff report for PAR 1146.

1-3 Contrary to the comment, in actuality PAR 1146 does include a provision for the use of portable analyzers on a regular basis. The purpose of this provision is to help the owner and operator keep the boiler or heater tuned and compliant with the proposed limits.

The commentator is correct in pointing out that PAR 1146 states that the low fuel use units must achieve compliance with the 30 ppm NOx limit by January 1, 2015 or during burner replacement, whichever occurs later. Staff is no longer proposing compliance based on the unit's useful life.

1-4 The commentator is correctly interpreting paragraph (d)(2) to mean that tuning is prohibited within 250 hours or a 30-day period. It does not mean, however, that the owner or operator would be required to conduct tests every 250 hours or 30 days.

1-5 District staff appreciates the commentator's suggested rule language. However, the 40-hour operating period is applicable to internal combustion engines. Staff recognizes the need to tune these engines on a more frequent basis. Based on field experience, the 250 hours or 30-day period is an appropriate time interval for boilers and heaters subject to Rule 1146. However, we would be very open to review any data that would indicate that a different timeframe would be applicable to these types of equipment.

1-6 Since the time when the Initial Study was released, the referenced rule language has been changed to help clarify its intent. Utilizing a more user friendly protocol, units subject to PAR 1146 will be subject to monthly monitoring. Further, the annual source test requirement has been proposed on a less frequent interval. For example, units rated

between two and 10 mmBTU/hr will need to be source tested once every fiver years; units rated between 10 and 40 mmBTU/hr will need to be source tested once every three years; and units rated greater than or equal to 40 mmBTU/hr will continue to be subject to CEMS requirements.

1-7 The commentator's understanding of the standard and enhanced compliance option seems to be correct.

1-8 The text in the technology description has been clarified to explain that SCR retrofits do not always require booster fans and new stacks. However, for a worst-case analysis, the construction of booster fans and new stacks is included and assumed in the air quality impacts analysis. Further, the reaction of NOx with ammonia in SCR systems has been clarified to say that the reaction occurs in the presence of the catalyst, but that it does not react with the catalyst itself.

1-9 District staff understands that burner retrofits are case specific and most installations have unique circumstances. As there are three general types of low-NOx burners, owners/operators would choose the burner and control system that best matches the current boiler. They are not forced to use burners or systems that do not match their needs. The three types of low-NOx burners are 1) pre-mix radiant burners with large surface area to reduce peak flame temperature, 2) standard type burners with greater amounts of pre-mixed combustion air (greater excess air) and better mixing of fuel and air to reduce peak temperature, and 3) pre-mix burners with fuel-rich and fuel-lean zones. Depending upon the application, there are also different types of burner control systems.

While it is true that some types of pre-mix radiant burners use sintered metal materials, it is not necessary to use this type of burner head to achieve NOx emission limits less than 20 ppm in larger boilers. Pre-mix radiant burners achieving emission limits less than 20 ppm typically use a woven metal fiber material because it is suited for ultra-low NOx applications.

Though it may be necessary for users to improve their pre-treatment system when upgrading a burner, it is likely that users of landfill and digester gases currently have pre-treatment and may have to upgrade treatment systems as opposed to installing a new system. Some burners may also not be sensitive to the current landfill and digester gas streams and would not require additional pre-treatment. The choice of equipment would be made by the owner/operator of the boiler depending upon their operational requirements.

Owners/operators of boilers burning landfill or digester gas currently have to regulate the delivery of fuel and air to the existing burner. Operators of this equipment may have to modify the current system (gas boosters and/or compressors) but that would depend upon the type of burner they chose to replace the existing burner. If an owner decided to keep the existing burner and increase the excess air to the burner to reduce NOx emissions, that might require additional modifications, but that would be the owner's choice. Space and operational constraints and installation and operating costs for modifications would be analyzed by the owner of equipment before a change is made.

In the event that a boiler is replaced, it is likely that the new boiler would be more efficient and hence smaller that the older unit. In most cases, one would not expect that additional space would be needed for a new replacement boiler. The decision to retrofit or replace the unit would be based on the characteristics of the equipment.

While it may be somewhat involved with doing burner replacements, no major heavy-duty construction equipment is required to do so.

1-10 Staff has contacted several ultra-low NOx burner manufacturers and installers. According to these vendors and installers, there may be an increase in fuel usage with these burners. However, the incremental fuel usage is estimated to be range from approximately one to two percent. As part of their rulemaking effort, staff is encouraging the application of more fuel efficient burners.

There were about 150 CO source tests conducted on units that were retrofitted ultra-low NOx burners in the San Joaquin Valley Unified APCD. The average CO emissions from these units were less than 20 ppm as compared to our Rule 1146 standard of 400 ppm. On this basis, there does not appear to be adverse CO impacts associated with the installation of ultra-low NOx burners.

The 1,000 or more units affected with the installation of ultra-low NOx burners are slightly overstated. The actual number of affected units would be less, approximately 918 units, given the application of SCR for the larger units (> 75 mmBTU/hr) and the low fuel usage units that already comply with the 30 ppm NOx limit. The air quality discussion in Chapter 4 of the Draft EA contains an analysis of the GHG impacts relative to the fuel penalty. For a worst-case analysis, the operational GHGs were quantified based on a two percent fuel penalty for ultra-low NOx burners and on a five percent fuel penalty for SCRs.

APPENDIX E

COMMENT LETTER ON THE DRAFT EA AND RESPONSES TO COMMENTS

Comment Letter #1
(Sanitation Districts of Los Angeles County via email)

-----Original Message-----
From: tfang lacsd.org
Sent: Tuesday, July 29, 2008 4:05 PM
To: Barbara Radlein
Cc: Gary Quinn; Joe Cassmassi; Rothbart, David; Stewart, Ed; Adams, Greg
Subject: PAR 1146 EA comments

Dear Ms. Radlein,

The following are a few minor comments on the Draft Environmental Assessment for PAR 1146. We appreciate the detailed evaluation of environmental impact from the proposed rule change, as well as for the opportunity to comment. Thank you also for the response to our Feb. 28, 2008 letter contained in Appendix D of the EA. Further, we have some minor comments on PAR 1146 & 1146.1 rule language which we will send to Gary and Joe separately.

1- Digester Gas Units: PAR 1146 EA evaluates the impact on digester gas boilers by using "6" as the number of units being affected. A cursory survey among major public wastewater agencies indicated to us that this estimate should be revised. Our survey suggest there are at least nine (9) R1146 digester gas boilers in the South Coast Air Basin. Should you require, we can supply you more detailed info on operator, size and contacts for these units. 1-1

2- Air Quality Impact from SCRs: We noted and appreciated the extensive analysis of SCR retrofit emissions, both construction and operational. However, we noted some inconsistency within the document. Specifically, in the Air Quality Impact discussion (pages 4-6 and 6-7 [sic]), operational emissions do not account for criteria emissions increases due to increased electrical/energy use from SCR systems (parasitic loads from pumps, fans, and possibly heaters). In the Energy Impact section (page 4-34), SCR operational burden is stated as 0.7 (and as high as 7.0) percent. Meanwhile, in the Climate Change impact section (pages 4-22 to 4-25), the increased fuel use from operating SCR systems is estimated at 5%. While we realize these are all estimates and relatively low values, we suggest that air quality (criteria emissions) and perhaps energy impact be evaluated assuming 5% SCR operational burden, consistent with the GHG impact evaluation. 1-2

3- Project Description: Similar to comments made in our Feb. 28, 2008 letter, we'd like to point out that some of the introductory explanations of the project description appears to be incorrect. Specifically, page 2-3 (also p. 1-7) still states "For Group II units, both standard and enhanced compliance dates are provided because equipment type and operation may make it difficult for a unit to comply with the enhanced option on a continuous basis." This appears to be incorrect, and was addressed on pg. 3 of our 2/28/08 letter (marked as "1-7" in App. D of the EA). Similarly, the project description (pg. 2-3 and 1-8) about "compliance determination at least every 250 hours or 30 days subsequent to tuning..." is still unchanged (see pg. 2 of our 2/28/08 letter, marked as "1-4" in App. D). 1-3

Lastly, page 2-5 (and p. 1-7) says "Emission checks via portable analyzers or a continous in-stack NOx monitor will be allowed for initial compliance determinations of NOx and CO emissions and will be required on a monthly basis...." We are puzzled by this statement as boilers >40 MMBtu/hr with >200 x 10^{-9} BTU annual usage must have NOx CEMS, and are not subject to monthly portable analyzer checks. Other smaller boilers without CEMS will have to self-test with portable analyzers monthly starting 7/1/09. All units are subject to initial as well as source testing every 3 or 5 years (previously annual) using approved R304 labs and full test methods (including CTM-030 or ASTM D6522). The project description does not seem to reflect the requirements PAR 1146. 1-4

Thanks again for the opportunity to comment. If we are misundertanding any of the above points, please let us know.

Best regards,
Tom C. Fang, P.E.
Sanitation Districts of Los Angeles County
562-908-4288, x2132
562-699-4515 fax
tfang@lacsd.org

Responses to Comment Letter #1
(Sanitation Districts of Los Angeles County, July 29, 2008)

1-1 At the time the Draft EA was prepared, the SCAQMD's permitting database indicated that there were only six digester gas boilers with a rating greater than or equal to five mmBTU/hr. For this reason, the analysis in the Draft EA was based on six units. After investigating the comment suggesting that there should be nine units instead of six, staff re-examined the database and found three units that were erroneously assigned the wrong fuel type code for the equipment category. The Final EA has been modified to reflect the evaluation for nine, not six, digester gas boilers. It is important to note that the adjustments to the digester gas boiler calculations do not result in a substantial change to the document and the overall emission reductions and emission impacts. Further, the adjusted calculations do not alter the conclusions reached in the Final EA. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15088.5.

1-2 The air quality analysis did not include potential emission increases of criteria air pollutants from the electrical power needed to operate electrical components of the SCR systems (pumps, fans and heaters) because the air emissions created at the source of electrical power generation have been previously analyzed for the utilities/power generators under separate CEQA documents. Re-analyzing these emissions in this EA would be considered double counting. Thus, this EA does not quantify these emissions in the Air Quality section.

Further, there is a distinctive difference between the electrical energy demand from operating SCRs versus the fuel penalty expected relative to the generation of GHGs from operating SCRs. According to a 1988 SCR demonstration project performed by Southern California Edison, the electrical energy demand (i.e., electricity needed from the utility) in order to operate the SCRs and associated equipment can range between 0.7 to seven percent. However, in addition to electricity demand, there is also an expected fuel penalty of five percent from operating SCRs. This means that five percent more fuel will be combusted as a result of installing and operating SCR units which translates into an increase of CO2, a greenhouse gas. The commentator's suggestion that the electricity demand be consistent with the global warming analysis and be evaluated at five percent, instead of seven percent, would make the evaluation less conservative than what is expected from SCR equipment and from what was analyzed in the EA. Therefore, the analysis has not been modified as a result of this comment.

1-3 A comment in the commentator's previous letter dated February 28, 2008 and marked as "1-7" in Appendix D of the EA stated that the intent of the "enhanced option" is to require additional NOx reductions in return for more time. Staff's response to this comment at that time indicated that the commentator's understanding of this option is correct. However, this concurrence did not mean to suggest that the description in the EA was incorrect. On the contrary, some boiler applications may have tremendous load swings and in turn, may have difficulty in complying with the NOx standard via ultra-low NOx burners. In this situation, the

facility owner or operator has the option to apply for a permit to construct an SCR in order to comply with the requirements in PAR 1146.

Similarly, the comment in the commentator's previous letter dated February 28, 2008 and marked as "1-4" in Appendix D of the EA expressed a correct interpretation of the rule language regarding compliance determination requirements. Further, there was no request in the letter for different rule language. Staff has no plans to change the rule language relative to compliance determinations. However to improve clarity and understanding of the compliance determination subdivision in PAR 1146, an explanation regarding the intent of this part will be included in the Final Staff Report for PAR 1146.

1-4 In the interest of brevity and to avoid repetition of detailed rule language, the various rule requirements were condensed. However, the condensed description of the rule language in the EA was not intended to supersede the actual text or intent of what is proposed in the version of PAR 1146 that was included in Appendix A of the Draft EA. The commentator's interpretation of the rule requirements is correct.