

**Proposed Amendments to  
BAAQMD Regulation 9, Rule 7**

**APPENDIX C  
CEQA Initial Study and Negative Declaration**

**Initial Study/Negative Declaration for the  
Amendments to Bay Area Air Quality  
Management District Regulation 9, Rule 7:  
Nitrogen Oxides and Carbon Monoxide from  
Industrial, Institutional, and Commercial Boilers,  
Steam Generators and Process Heaters**

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**Chapter 1**

Introduction..... 1-1  
 Purpose of This Document..... 1-1  
 Scope of This Document..... 1-1  
 Impact Terminology..... 1-2  
 Organization of This Document..... 1-2

**Chapter 2**

Description of the Proposed Rule ..... 2-1  
 Background..... 2-1  
 Objectives ..... 2-1  
 Rule Amendments Being Considered..... 2-2  
 Proposed Method of Control..... 2-6  
 Potential Emission Reductions ..... 2-9  
 Affected Area..... 2-11

**Chapter 3**

Environmental Checklist..... 3-1  
 Environmental Checklist Form..... 3-1  
 Environmental Factors Potentially Affected..... 3-2  
 Determination ..... 3-2  
 I. Aesthetics..... 3-3  
     Setting ..... 3-3  
     Regulatory Background ..... 3-3  
     Discussion of Impacts ..... 3-4  
 II. Agriculture Resources..... 3-5  
     Setting ..... 3-5  
     Regulatory Background ..... 3-5  
     Discussion of Impacts ..... 3-6  
 III. Air Quality ..... 3-7  
     Setting ..... 3-7  
     Regulatory Background ..... 3-13  
     Discussion of Impacts ..... 3-16  
 IV. Biological Resources ..... 3-24  
     Setting..... 3-24  
     Regulatory Background..... 3-25  
     Discussion of Impacts ..... 3-25  
 V. Cultural Resources ..... 3-26  
     Setting..... 3-26  
     Regulatory Background..... 3-26  
     Discussion of Impacts ..... 3-27

VI. Geology and Soils .....	3-28
Setting.....	3-28
Regulatory Background.....	3-29
Discussion of Impacts .....	3-30
VII. Hazard and Hazardous Materials .....	3-32
Setting .....	3-32
Regulatory Background .....	3-33
Discussion of Impacts .....	3-34
VIII. Hydrology and Water Quality.....	3-39
Setting .....	3-40
Regulatory Background .....	3-40
Discussion of Impacts .....	3-41
IX. Land Use and Planning .....	3-43
Setting .....	3-43
Regulatory Background .....	3-43
Discussion of Impacts .....	3-43
X. Mineral Resources .....	3-44
Setting .....	3-44
Regulatory Background .....	3-44
Discussion of Impacts .....	3-44
XI. Noise .....	3-45
Setting .....	3-45
Regulatory Background .....	3-45
Discussion of Impacts .....	3-46
XII. Population and Housing.....	3-47
Setting .....	3-47
Regulatory Background .....	3-47
Discussion of Impacts .....	3-47
XIII. Public Services.....	3-49
Setting .....	3-49
Regulatory Background .....	3-49
Discussion of Impacts .....	3-49
XIV. Recreation .....	3-51
Setting .....	3-51
Regulatory Background .....	3-51
Discussion of Impacts .....	3-51
XV. Transportation and Traffic .....	3-52
Setting .....	3-52
Regulatory Background .....	3-53
Discussion of Impacts .....	3-53
XVI. Utilities and Service Systems.....	3-55
Setting .....	3-55
Regulatory Background .....	3-56
Discussion of Impacts .....	3-56

XVII. Mandatory Findings of Significance ..... 3-58  
 Discussion of Impacts ..... 3-58

**Chapter 4**

References ..... 4-1

**FIGURES:**

Figure 1 – Bay Area Air Quality Management District..... 2-12

**TABLES:**

Table 2-1 Reg. 9-7 Proposed Amendment Summary..... 2-3  
 Table 3-1 Federal and State Ambient Air Quality Standards..... 3-11  
 Table 3-2 Bay Area Air Pollution Summary 2006..... 3-12  
 Table 3-3 Bay Area Air Quality Summary ..... 3-13  
 Table 3-4 Summary of 2003 BAAQMD Ambient Air Toxics  
 Monitoring Data..... 3-14  
 Table 3-5 CO<sub>2</sub> Reduction from Insulation and Small Boiler Tune-Ups  
 Including Efficiency Loss, 20 – 75 MM BTU/hr Heaters,  
 Tons/day..... 3-20

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## Chapter 1

# Introduction

### **Purpose of this Document**

This Negative Declaration (Neg Dec) assesses the environmental impacts of the proposed adoption of amendments to Regulation 9, Rule 7 – Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters - by the Bay Area Air Quality Management District (BAAQMD or District). This assessment is required by the California Environmental Quality Act (CEQA) and in compliance with the state CEQA Guidelines (Title 14 California Code of Regulations §15000 et seq.). A Neg Dec serves as an informational document to be used in the decision-making process for a public agency that intends to carry out a project; it does not recommend approval or denial of the project analyzed in the document. The BAAQMD is the lead agency under CEQA and must consider the impacts of the proposed rule amendments when determining whether to adopt them. The BAAQMD has prepared this Neg Dec because no significant adverse impacts are expected to result from the proposed rule amendments.

### **Scope of this Document**

This document evaluates the potential impacts of the proposed amendments on the following resource areas:

- aesthetics,
- agricultural resources,
- air quality,
- biological resources,
- cultural resources,
- geology and soils,
- hazards and hazardous materials,
- hydrology and water quality,
- land use planning,
- mineral resources,

- noise,
- population and housing,
- public services,
- recreation,
- transportation and traffic, and
- utilities and service systems.

### **Impact Terminology**

The following terminology is used in this IS/ND to describe the levels of significance of impacts that would result from the proposed rule amendments:

- An impact is considered *beneficial* when the analysis concludes that the project would have a positive effect on a particular resource.
- A conclusion of *no impact* is appropriate when the analysis concludes that there would be no impact on a particular resource from the proposed project.
- An impact is considered *less than significant* if the analysis concludes that an impact on a particular resource topic would not be significant (i.e., would not exceed certain criteria or guidelines established by BAAQMD). Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource.
- An impact is considered *less than significant with mitigation incorporated* if the analysis concludes that an impact on a particular resource topic would be significant (i.e., would exceed certain criteria or guidelines established by BAAQMD), but would be reduced to a less than significant level through the implementation of mitigation measures.

### **Organization of This Document**

The content and format of this document, described below, are designed to meet the requirements of CEQA.

- Chapter 1, “Introduction,” identifies the purpose, scope, and terminology of the document.
- Chapter 2, “Description of the Proposed Rule,” provides background information of Regulation 9, Rule 7, describes the proposed rule amendments, and describes the area and facilities that would be affected by the amendments.
- Chapter 3, “Environmental Checklist,” presents the checklist responses for each resource topic. This chapter includes a brief setting description for each resource

area and identifies the impact of the proposed rule amendments on the resources topics listed in the checklist.

- Chapter 4, “References Cited,” identifies all printed references and personal communications cited in this report.

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## Chapter 2

# Description of the Proposed Rule

### BACKGROUND

The BAAQMD regulates NO<sub>x</sub> emissions from boilers, steam generators, and process heaters that are used in industrial, institutional or commercial applications under Regulation 9, Rule 7, (“Regulation 9-7”). Regulation 9-7 currently imposes a 30 ppmv NO<sub>x</sub> limit on industrial, institutional, and commercial boilers with a rated heat input of 10 million British thermal units per hour (MMBtu/hr) or more; devices that use non-gaseous fuel that have a heat rating of 1 MMBtu/hr or more have a 40 ppmv NO<sub>x</sub> limit. Regulation 9-7 was adopted September 15, 1993. Bay Area 2005 Ozone Strategy Control Measure SS-12 (Nitrogen Oxides and Carbon Monoxides from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters) proposed amendments to Bay Area Air Quality Management District Regulation 9-7. The proposed amendments to Regulation 9-7 would implement Control Measure SS-12 by supplementing existing requirements in Regulation 9-7.

Regulation 9-7 is a non-industry specific rule that applies to almost any combustion device that is not subject to a more specific combustion rule, including new and existing small boilers used to provide hot water or steam to office buildings, commercial establishments, hospitals, hotels and industrial facilities; larger boilers used to provide hot water or steam for industrial uses; and process heaters used to heat material streams at industrial facilities. For simplicity, all these devices are referred to as heaters in this document. Regulation 9-7 does not apply to residential central furnaces, residential water heaters, combustion devices used in petroleum refineries, or electric utility steam boilers. Also, Regulation 9-7 does not apply to space heating; to devices that burn only natural gas or liquefied petroleum gas (LPG) fuel and that have a heat rating less than 10 MMBtu/hr); to devices that burn non-gaseous fuel and that have a heat rating less than 1 MMBtu/hr; or to devices classified as ovens, kilns, furnaces or dryers.

### OBJECTIVES

In Control Measure SS-12, the District suggested review of NO<sub>x</sub> emission requirements for industrial, institutional, and commercial boilers, steam generators, and process heaters. The objective of the amendments for Regulation 9-7 is to further reduce NO<sub>x</sub> emissions from natural gas or LPG-fired devices in order to reduce ozone levels in the Bay Area and reduce transport of air pollutants to neighboring air basins. The Bay Area and neighboring regions are not yet in attainment with the State one-hour ozone standard, so further reductions in ozone precursors, NO<sub>x</sub> and reactive organic gases (ROG), are needed. Additional NO<sub>x</sub> reductions can be achieved by a technique involving the premixing of fuel and air before combustion takes place in water heaters, boilers and

process heaters. This results in a lower and more uniform flame temperature, which reduces formation of NO<sub>x</sub>.

The U.S. Environmental Protection Agency (U.S. EPA) has set primary national ambient air quality standards for ozone and other air pollutants to define the levels considered safe for human health. The California Air Resources Board (CARB) has also set a California ozone standard. The Bay Area is a non-attainment area for the state one-hour ozone standard and federal eight-hour ozone standard. Under State law, ozone non-attainment areas must prepare plans showing how they will attain the state standard. The 2005 Ozone Strategy is the most recent planning document for the State one-hour ozone standard. Because the Bay Area is a marginal non-attainment area for the national eight-hour standard, the least severe non-attainment classification, the BAAQMD is not required to prepare an attainment plan for the national standard. In addition, NO<sub>x</sub> emissions react in the atmosphere to form secondary particulate matter. The Bay Area is not in attainment of California ambient air standards for particulate matter of 10 microns or less (PM<sub>10</sub>) or for particulate matter of 2.5 microns or less (PM<sub>2.5</sub>).

## **RULE AMENDMENTS BEING CONSIDERED**

A summary of the amendments to Regulation 9-7 are included in Table 2-1.

### **Extend Regulation 9-7 to Heaters Rated Less Than 10 MM BTU/hr**

Control Measure SS-12 proposes extending the applicability of Regulation 9-7 to heaters with a maximum firing capacity below 10 MMBtu/hr. Several California air districts have adopted rules that apply a 30 ppmv NO<sub>x</sub> concentration standard to heaters with heat ratings as low as two MMBtu/hr. Compliance with a 30 ppmv NO<sub>x</sub> standard is achievable for heaters burning natural gas or LPG fuel by retrofitting existing burners with low-NO<sub>x</sub> burners. However, for some heaters a low-NO<sub>x</sub> burner retrofit may not be available or may not be practical to install and these devices would have to be replaced. If a retrofit is available, it may require that the maximum firing capacity of the heater be reduced or may result in an overall loss of efficiency that would require the device to be replaced. The proposed amendments establish a 30 ppmv exhaust concentration limit for heaters rated up to 5 MMBtu/hr. In addition, the proposed amendments establish a 15 ppmv exhaust concentration limit for heaters rated greater than 5 but less than 10 MMBtu/hr. A low-fuel usage exemption is proposed for heaters with annual fuel use less than 10% of capacity utilization. This is equivalent to 90,000 therms per year for a 10 MMBtu/hr boiler.

The Air District has proposed an effective date for the standards affecting heaters rated less than 5 MMBtu/hr of 1/1/2011, although a heater manufactured prior to 1/1/2011 would not be subject to the proposed NO<sub>x</sub> standards until 10 years after its original manufacture date. Heaters manufactured on or after 1/1/2011 would be subject to the proposed standards on 1/1/2011.

**TABLE 2-1**

**Reg. 9-7 Proposed Amendment Summary**

<b>Heater Size Range (MMBtu/hr)</b>	<b>Devices<sup>(1)</sup></b>	<b>Current NOx (ton/day)<sup>(2)</sup></b>	<b>Current NOx (ppmv)<sup>(3)</sup></b>	<b>Proposed NOx (ppmv)</b>	<b>NOx Reduction (ton/day)</b>
>2 to 5	1238	2.01	78	30	1.15
>5 to <10	1396	2.27	78	15	1.72
>2 to <10 TOTALS	2634	4.28			2.87
10 to <20	164	0.26	30	15	0.06
20 to <75	125	0.56	30	9	0.19
75 to <410	21	0.09	27	5	0.07
410	1	0.02	12	5	0.01
10 and larger TOTALS	311	0.93			0.33
<b>TOTALS</b>	<b>2945</b>	<b>5.21</b>			<b>3.20</b>

Notes:

- (1) The number of devices in the >2 to 5 and >5 to <10 categories is estimated to be 2634.
- (2) BAAQMD Staff Report for Regulation 9, Rule 7.
- (3) The current NOx emission rate for each subcategory is 30 ppmv for sub-categories subject to the current rule and 78 ppmv for the sub-categories of devices <10 MM BTU/hr that are not currently subject to the rule. For the categories “75 to <410”, the emission rate is lower than 30 ppmv because devices that have a permit condition limit of 9 ppmv have been incorporated on a weighted basis. For the sole 410 MM BTU/hr unit, the emission rate is the permit condition requirement for the one device in the sub-category (Permit Condition 14049.50).

The proposed amendments to Regulation 9-7 would establish a manufacturer certification requirement for new gas-fired devices rated more than 2 but less than 10 MMBtu/hr, and establish a registration program for operators of new and existing devices in this size range.

**Reduce Regulation 9-7 NOx Exhaust Concentration Limits**

Some California air districts have adopted rules that apply NOx concentration limits less than 30 ppmv to heaters with heat ratings of 10 MMBtu/hr or more. For heaters with heat ratings higher than 20 MMBtu/hr, compliance with a 9 ppmv NOx limit has been achieved with natural gas or LPG fuel by retrofitting ultra low-NOx burners with or without flue gas recirculation (FGR) to control NOx formation, or by installing selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) to reduce the NOx concentration in the heater exhaust. However, for some heaters an ultra low-NOx burner retrofit may not be available or may not be practical to install and these devices would have to be replaced. For some heaters FGR or SCR/SNCR may not be practical to install because of space limitations. For load-following heaters, SCR/SNCR may not achieve a 9 ppmv concentration, so a limit of 15 ppmv is proposed for these devices of 20

MMBtu/hr or more. For some heaters, installation of ultra low-NOx burners or FGR may require that the maximum firing capacity of the heater be reduced or may result in an overall loss of efficiency that would require the heater to be replaced.

**Heaters Rated Between 5 MMBtu/hr and 20 MMBtu/hr:** For heaters with heat ratings between 10 and 20 MMBtu/hr, compliance with a 15 ppmv NOx standard has been proposed since it has been achieved with natural gas or LPG fuel by retrofitting ultra low-NOx burners with or without flue gas recirculation (FGR). However, as for larger heaters, an ultra low-NOx burner retrofit or FGR may not be available or may not be practical to install and these devices would have to be replaced or have their maximum firing capacity reduced. The Air District has proposed an effective date for the standards affecting heaters rated from 10 MMBtu/hr up to 20 MMBtu/hr of 1/1/2012, although a heater manufactured prior to 1/1/2012 would not be subject to the proposed NOx standard until 10 years after its original manufacture date. Heaters manufactured on or after 1/1/2012 would be subject to the proposed standards on 1/1/2012. Facilities with multiple units would be allowed to comply over several years. An initial source test for heaters of at least 10 MMBtu/hr and periodic compliance monitoring for all heaters will be required.

**Heaters Rated Between 20 MMBtu/hr and less than 75 MMBtu/hr:** For heaters rated from 20 to less than 75 MMBtu/hr, a 9 ppmv NOx limit is proposed, effective January 1, 2011. Compliance with this limit can be achieved with ultra-low NOx burners with FGR. Some operators may elect to use SCR to comply with this standard. All of the devices in this size category are required to have air permits and only 19 currently operate at NOx emissions lower than 30 ppmv (only one operates at 9 ppmv). Therefore, all but one of the heaters in this size category will have to be modified or replaced if they continue to operate after January 1, 2011. New heaters installed on or after January 1, 2012 will be subject to the new standard upon installation. Heaters in service prior to January 1, 2012 will become subject to this standard upon reaching a service life of five years. Facilities with multiple heaters would be allowed to comply over several years.

**Heaters Rated More than 75 MMBtu/hr:** For heaters rated 75 MMBtu/hr and higher, Regulation 9-7 would require a NOx standard of 5 ppmv, effective January 1, 2012. the five-year Service Life Allowance granted to heaters over 20 MMBtu/hr would apply to these heaters as well. Heaters in this size range would be expected to use SCR or SNCR to comply with these standards. An initial source test and periodic compliance monitoring will be required.

**Other Proposed Amendments:** Landfill gas and wastewater digester gas fuels have greater variability in heat value and other specifications than natural gas. This variability makes it more difficult to optimize a heater that uses these fuels for low NOx emissions. For this reason, and because combustion of these fuels is quite limited in the Bay Area, the proposed amendments establish a 30 ppmv NOx limit for these fuels in every regulated size category.

Regulation 9-7 currently allows a 40 ppmv NO<sub>x</sub> limit for combustion of non-gaseous fuels in heaters with heat ratings of 10 MMBtu/hr or more, compared to 30 ppmv for gaseous fuels. Because non-gaseous fuels cannot be mixed with combustion air as completely as gaseous fuels, reduction of combustion hot-spots and associated NO<sub>x</sub> formation is more difficult for non-gaseous fuels. For this reason, and because combustion of non-gaseous fuel is quite limited in the Bay Area, the proposed amendments retain a 40 ppmv NO<sub>x</sub> limit for nongaseous fuel in heaters in every regulated size category. Heaters firing a combination of non-gaseous and gaseous fuels would have to meet a heat-input weighted average of the applicable NO<sub>x</sub> limit for the heater size category and the 40 ppmv non-gaseous fuel limit.

Heaters with input heat ratings up to 10 MMBtu/hr would be exempt from the new standards if they use less than 10% of their maximum heat capacity per year. These heaters would require annual tune-ups and would be required to operate at less than 3% stack gas oxygen content. Low-usage heaters larger than 10 MMBtu/hr would also be required to meet a 30 ppmv NO<sub>x</sub> standard.

### **Insulation Requirements**

Heat loss from inadequately insulated surfaces is typically one of the largest contributors to energy inefficiency in a heater. Energy inefficiency results in increased fuel consumption with related emissions of NO<sub>x</sub> and greenhouse gases. The proposed amendments to Regulation 9-7 require insulation of all heaters subject to the rule, such that exposed surfaces do not exceed 120 degrees Fahrenheit, effective January 1, 2010. Some exemptions are provided for safety reasons, to high-temperature water boilers as defined in the California Code of Regulations, to surfaces that must remain un-insulated for safety or operational reasons, to boilers with at least one inch of insulation, and to exhaust stacks. This requirement applies to boilers and steam generators, but not to process heaters.

### **Inspection and Tune-Up Requirements**

Currently, Regulation 9-7 requires tune-ups only for heaters that qualify for a low fuel-usage exemption, in lieu of compliance with the 30 ppmv NO<sub>x</sub> limit. The proposed amendments to Regulation 9-7 includes an annual tune-up requirement for most heaters subject to the rule, effective in 2009. A tune-up consists of re-optimizing the air to fuel ratio. Tune-ups can reduce energy inefficiency by as much as 10%, reducing fuel usage, CO<sub>2</sub> and NO<sub>x</sub> emissions. Inspections will check for blowdown rates, and heater and stack gas temperatures. Blowdown rates can be adjusted to manufacturers specifications, reducing energy loss from heat in the liquid blowdown stream.

### **Stack Gas Temperature Limits**

Regulation 9-7 proposes stack gas temperature limits that would become effective on January 1, 2011. The rule would limit stack gas temperatures in firetube boilers or steam generators to no more than 100°F over the steam or water temperature for gaseous or

non-gaseous fuel or 250°F over the ambient temperature for gaseous fuel or 300°F over the ambient temperature for non-gaseous fuel. The stack gas temperature in watertube boilers and steam generators would be limited to no more than 150°F in over the steam or water temperature for gaseous and non-gaseous fuel, or to the same temperature increments over the ambient temperature as firetube boilers. This requirement applies to boilers and steam generators, but not to process heaters.

### **Periodic Monitoring**

To ensure that heaters rated at 10 MMBtu/hr or more operate in compliance with Regulation 9-7, periodic monitoring of these devices will be required.

## **PROPOSED METHOD OF CONTROL**

### **Emission Mechanisms and Controls**

The primary products of any combustion process are water vapor (H<sub>2</sub>O) and the greenhouse gas carbon dioxide (CO<sub>2</sub>). Because CO<sub>2</sub> is a necessary product of combustion, the only way to reduce CO<sub>2</sub> emissions from a combustion process without reducing the output of useful energy is to increase the thermal efficiency of the process, thereby reducing the fuel consumption rate.

In addition, all combustion processes produce all of the specific pollutants regulated by the Air District: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), volatile organic compounds (VOCs) and particulate matter. CO and NO<sub>x</sub> emissions are the focus of Regulation 9-7 and Control Measure SS 12. Emissions of SO<sub>x</sub>, VOCs and particulate matter are negligible compared to those of NO<sub>x</sub>, CO and CO<sub>2</sub> when natural gas fuel is used.

### **NO<sub>x</sub> Emissions**

In addition to fuel, combustion requires oxygen, so that carbon in the fuel can be oxidized to CO<sub>2</sub> and hydrogen in the fuel to H<sub>2</sub>O. Because ambient air is used as an oxygen source, and because ambient air contains almost four times as much nitrogen gas (N<sub>2</sub>) as oxygen gas (O<sub>2</sub>), N<sub>2</sub> gas is exposed to the high temperatures of the combustion process. Some of this N<sub>2</sub> gas is oxidized into NO and NO<sub>2</sub> (collectively known as NO<sub>x</sub>) and emitted in the combustion exhaust stream. This emitted NO<sub>x</sub> is known as “thermal NO<sub>x</sub>” because its formation depends on exposure to combustion temperatures – higher combustion temperatures and longer exposure result in a greater NO<sub>x</sub> formation rate and higher concentrations of NO<sub>x</sub> in the exhaust stream.

In addition, all common fuels contain elemental nitrogen (N) or N<sub>2</sub> that is also oxidized in the combustion process. Natural gas contains very little nitrogen, while refined fuel oils, such as diesel, can contain significant concentrations of elemental nitrogen which can account for as much as half of the overall NO<sub>x</sub> emissions when standard fuel oils are burned. The emitted NO<sub>x</sub> that results from nitrogen in the fuel is known as “fuel NO<sub>x</sub>”.

## NOx Controls

Because “thermal NOx” and “fuel NOx” are created through independent mechanisms, NOx emission controls may be designed to reduce thermal NOx formation, to reduce fuel NOx formation, or to reduce the concentration of previously-formed fuel and thermal NOx after it reaches the exhaust stream (post-combustion control).

The nitrogen content of pipeline natural gas is limited by federal Department of Energy standards (four percent by volume). The nitrogen content of diesel fuel, which is the only non-gaseous fuel in significant use in the Bay Area, is not explicitly limited by either state or federal standards. However, virtually all diesel fuel marketed in California since 2006 complies with “ultra low-sulfur diesel” (ULSD) standards that limit sulfur content to 15 ppmv by weight and the processes used to remove sulfur from diesel also remove nitrogen. This nitrogen removal is so effective that the amount of fuel NOx created in diesel fuel combustion may also be considered to be negligible compared to the amount of thermal NOx. Therefore, only thermal NOx controls are considered in the proposed amendments to Regulation 9-7.

Thermal NOx emissions can be reduced by lowering the average combustion temperature and by eliminating combustion “hot spots”. “Low-NOx burners” achieve a lower average combustion temperature by creating a larger flame which dilutes the flame energy over a larger volume, or by performing combustion in more than one stage. In staged combustion, only partial combustion occurs in the first stage because either the oxygen or fuel concentration is restricted. The exhaust gases from the first stage proceed to subsequent stages where combustion is allowed to proceed by increasing the concentration of the restricted component (oxygen or fuel). The combustion temperature of the second and subsequent stages is reduced because some of the exhaust gases from the first stage are inert and will not burn. Low-NOx burners may also limit the amount of “excess air” used. Heaters normally operate with some degree of “excess air” beyond that which is theoretically required for complete fuel combustion in order to ensure that fuel is not wasted and to prevent uncontrolled detonation of unburned fuel outside of the combustion zone. However, the greater the amount of excess air, the more nitrogen and oxygen is available to form NOx. Limiting the level of excess air reduces the potential amount of NOx that can form, while improving combustion efficiency. Hot spots in the combustion zone may be minimized by thoroughly mixing fuel and combustion air upstream of the burner. Low-NOx burners, by themselves, will reduce NOx emissions by at least 10 percent and as much as 50 percent compared to basic burners, and typically will not reduce overall combustion efficiency. However, low-NOx burners usually create a longer flame, so some existing heaters may not have sufficient space to allow such a burner to be retro-fitted. If a retrofit is possible, the maximum firing capacity of the device may have to be reduced, possibly to an unacceptable level, to accommodate the longer flame. Burners that are capable of NOx concentrations of 15 ppmv or less are referred to as “ultra low-NOx burners”.

“Flue gas recirculation” (FGR) reduces flame temperature by diverting some of the combustion exhaust gas back to the burner inlet, where it is mixed with the fuel and combustion air. The exhaust gas, while hot, is cooler than the combustion temperature, so the use of FGR reduces the average flame temperature. Also, the diverted flue gas will have a depleted oxygen content compared to ambient air, so will also lower the level of excess oxygen available to form NO<sub>x</sub>. FGR, by itself, will reduce NO<sub>x</sub> emissions by as much as 80 percent, but is most commonly used in conjunction with low-NO<sub>x</sub> burners. It is less likely that a given burner can be successfully retrofitted with FGR than with a low-NO<sub>x</sub> burner because an FGR system must not only be compatible with the burner assembly, but may also have significant space requirements for ductwork to return a portion of the exhaust to the combustion chamber and a blower. State-of-the-art ultra low-NO<sub>x</sub> burner systems have been able to incorporate an “induced FGR” technique, that draws firebox air directly into the nozzle and mixes it with the fuel, rather than draw from the stack. There is no need for external fans or ductwork with these systems.

A technique similar to FGR is the injection of water or steam into the combustion zone to lower combustion temperature. This technique can cause a significant loss of efficiency and is typically used only on the largest heaters in conjunction with low NO<sub>x</sub> burners. This was the first type of NO<sub>x</sub> control, now replaced by ultra low-NO<sub>x</sub> burners, that reach low NO<sub>x</sub> levels with dry air.

NO<sub>x</sub> emissions can also be reduced with add-on controls that convert previously-formed NO<sub>x</sub> to N<sub>2</sub> by reacting NO<sub>x</sub> with ammonia (NH<sub>3</sub>), with or without the use of a catalyst. These post-combustion controls are SCR and SNCR systems. NO<sub>x</sub> catalysts operate well only in a narrow temperature band, so SCR systems are not used in “load-following” applications where a heater operates over a wide load range, which results in a wide temperature variation at the exhaust catalyst. SCR and SNCR systems can be costly to design, install and operate. As previously shown in Table 1, only five of these systems have been installed on heaters subject to Regulation 9-7, and in each case these devices were subject to stringent best available control technology (BACT) requirements of Regulation 2. SCR and SNCR systems are used on a number of other combustion devices in the District, primarily gas turbines and large stationary internal combustion engines. They are also in use in petroleum refineries to control NO<sub>x</sub> from boilers and process heaters which are subject to a separate District rule, Regulation 9-10.

In general, compliance with the current NO<sub>x</sub> standards in Regulation 9-7 has been achieved with low-NO<sub>x</sub> burners or FGR, or both, for all categories of boilers except the largest, those over 75 MMBtu/hr.

### **CO Emissions and Controls**

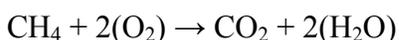
CO is produced by the incomplete oxidation of carbon in a fossil fuel to CO rather than to CO<sub>2</sub>. Because the Air District is in attainment status with all state and federal ambient air quality standards for CO, Regulation 9-7 attempts to limit the concentration of CO in the exhaust stream of combustion processes to a reasonable level (400 ppmv), but does not attempt to achieve further CO emission reductions. All other California air districts that

address CO emissions from combustion sources impose the same standard. In fact, new low-NOx burner designs minimize CO to far lower levels than 400 ppmv.

The most common NOx control strategies, which limit NOx formation by limiting combustion temperature, tend to also limit complete oxidation of carbon to CO<sub>2</sub>, thereby increasing the CO formation rate. In order to maintain CO emission levels below 400 ppmv, no control technology is required. Instead, the NOx control technology must be implemented in a way that does not result in an excessive CO formation rate.

### **Greenhouse Gas Emissions and Controls**

Combustion of conventional hydrocarbon fuel results in the release of energy as bonds between carbon and hydrogen are broken and reformed with oxygen to create water vapor (H<sub>2</sub>O) and the greenhouse gas carbon dioxide (CO<sub>2</sub>). For example, when methane (CH<sub>4</sub>), the primary constituent of natural gas, is burned, the reaction proceeds as follows:



Thus, CO<sub>2</sub> is not a pollutant that occurs in relatively low concentrations as a by-product of the combustion process; CO<sub>2</sub> is a necessary combustion product of any fuel containing carbon. Therefore, attempts to reduce emissions of greenhouse gases from combustion focus on increasing energy efficiency – consuming less fuel to provide the same useful energy output. The most efficient boilers generally operate at no more than 85 percent overall efficiency. In other words, only up to 85 percent of the heat value of the fuel that is consumed is transferred to the material that is being heated and the other 15 percent is released to the atmosphere as waste heat. Waste heat is released in three ways:

- as heat in the combustion exhaust which is released from the boiler stack,
- as radiant heat from the outside of the boiler because the boiler is not perfectly insulated,
- as heat in the liquid “blowdown” stream that is constantly drained from the boiler to prevent solids from concentrating inside the boiler and ultimately fouling the heat exchange surfaces.

The most significant of these factors is heat loss through the boiler stack. Stack losses may be minimized by minimizing the amount of excess air and therefore the amount of oxygen and nitrogen that is heated and released from the stack. As previously discussed under “NOx Controls”, above, reducing excess air to the minimum level necessary for complete fuel combustion, with a reasonable safety margin, is a very effective way to control NOx emissions.

In addition, boiler efficiency may be improved by limiting liquid blowdown to the lowest necessary level, by improving boiler shell insulation, and by maintaining clean boiler internals to maximize heat transfer to the medium being heated rather than to the atmosphere through the boiler stack.

The proposed amendments reduce CO<sub>2</sub> emissions.

### **POTENTIAL EMISSION REDUCTIONS**

For heaters rated between 2 and 10 MMBtu/hr, an emission limit of 30 ppmv will be established. There are 311 of these devices permitted in the Air District, but the total number is unknown since most are not subject to permit requirements. District staff used various sources to estimate the total number of these small boilers, including commercial gas usage data, estimates from boiler service companies and a review of San Francisco's boiler database. Although there is no existing standard for the smallest size category in Regulation 9-7, an emission concentration of 78 ppmv would be typical for a heater of this size with no emission controls, based on U.S. EPA's AP-42 document.

For heaters rated between 5 and 20 MMBtu/hr, the NO<sub>x</sub> emission limit will be reduced from 30 ppmv to 15 ppmv. All heaters of 10 MMBtu/hr and greater require permits in the Air District if fired on gaseous fuel. Heaters fired on non-gaseous fuel or with dual-fuel capability require permits if they are at least 1 MMBtu/hr. There are 164 of these devices currently permitted.

The proposed amendments to Regulation 9-7 will reduce the NO<sub>x</sub> emission limit that is applicable to heaters rated from 20 MMBtu/hr up to 75 MMBtu/hr from 30 ppmv to 9 ppmv. There are currently 125 of these devices permitted.

Finally, Regulation 9-7 proposes to reduce the allowable NO<sub>x</sub> emission limit on the largest heaters, those over 75 MMBtu/hr, to 5 ppmv. There are seven of these devices.

Most heaters that will be subject to Regulation 9-7 (those rated between two and 20 MMBtu/hr) will have their existing emission concentration limit or existing average emission level reduced by about 50 percent, although some of the heaters in each size range will probably be exempt from the proposed concentration limits because of low annual fuel use. The largest heaters (rated over 20 MMBtu/hr) will have their existing emission concentration limit reduced by 70 percent, although the emission reductions may be less to the extent that these devices already operate at emission concentrations less than 30 ppmv. Load following devices will be limited to a NO<sub>x</sub> concentration of 15 ppmv, for units of 20 MMBtu/hr or larger.

Therefore, as a preliminary estimate, it appears that the proposal will reduce emissions by about 50 percent from the new heaters that will become subject to Regulation 9-7, and also reduce emissions from already-controlled heaters by an additional 50 percent. The emissions from newly regulated heaters would be reduced by about 1.36 ton/day, and the emissions from currently controlled heaters by about 1.75 ton/day, for a total of approximately 3.1 ton/day of NO<sub>x</sub> reduced.

### **Other Impacts – Greenhouse Gases**

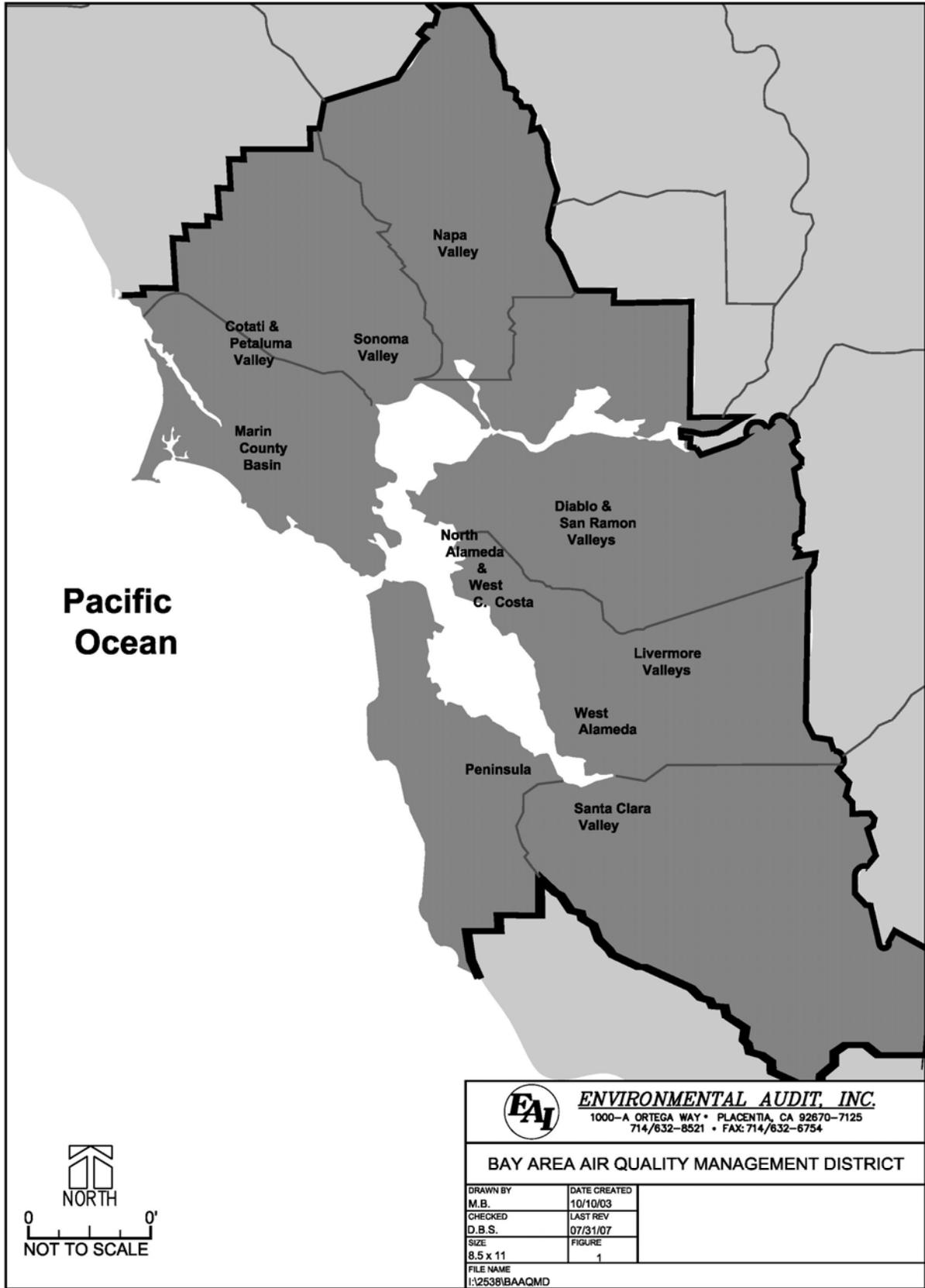
Carbon dioxide, the greenhouse gas emitted by heaters, will be reduced by the proposed amendments to Regulation 9-7. The requirements for heater insulation, inspections and tune-ups, and stack gas temperature limits will be reduced because these measures reduce fuel usage. Consequently, NOx emissions, proportional to the amount of fuel burned, will also be reduced.

### **AFFECTED AREA**

The proposed rule amendments would apply to facilities under BAAQMD jurisdiction. The BAAQMD jurisdiction includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma counties (approximately 5,600 square miles). The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys, and bays.

The facilities affected by the proposed rule amendments are located within the jurisdiction of the Bay Area Air Quality Management District (see Figure 1).

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**Chapter 3**

**Environmental Checklist**

**ENVIRONMENTAL CHECKLIST FORM**

- 1. Project Title:** Bay Area Air Quality Management District (BAAQMD)  
Proposed Amendments to Regulation 9, Rule 7.
- 2. Lead Agency Name and Address:** Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, California 94109
- 3. Contact Person and Phone Number:** Julian Elliot, Planning and Research Division  
415/749-4705 or [jelliot@baaqmd.gov](mailto:jelliot@baaqmd.gov)
- 4. Project Location:** This rule amendment applies to the area within the jurisdiction of the Bay Area Air Quality Management District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
- 5. Project Sponsor’s Name and Address:** Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, California 94109
- 6. General Plan Designation:** The rule amendments apply to boilers, steam generators, and process heaters that are used in industrial, institutional or commercial applications.
- 7. Zoning** The rule amendments apply to boilers, steam generators, and process heaters with a rated heat input greater than 2 mmBtu/hr excluding units used in petroleum refineries, by public electric utilities or qualifying small power production facilities, some waste heat recovery boilers, kilns, ovens, and furnaces for drying, baking, heat treating, cooking, calcining, or vitrifying which are generally found in industrial and commercial zones.
- 8. Description of Project** See “Background” in Chapter 2.
- 9. Surrounding Land Uses and Setting** See “Affected Area” in Chapter 2.
- 10. Other Public Agencies Whose Approval Is Required** None

### Environmental Factors Potentially Affected:

The environmental factors checked below would potentially be affected by this Project (i.e., the project would involve one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Aesthetics                    | <input type="checkbox"/> Agriculture Resources              | <input type="checkbox"/> Air Quality            |
| <input type="checkbox"/> Biological Resources          | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology/Soils          |
| <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality            | <input type="checkbox"/> Land Use/Planning      |
| <input type="checkbox"/> Mineral Resources             | <input type="checkbox"/> Noise                              | <input type="checkbox"/> Population/Housing     |
| <input type="checkbox"/> Public Services               | <input type="checkbox"/> Recreation                         | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities/Service Systems     | <input type="checkbox"/> Mandatory Findings of Significance |   |

### Determination:

On the basis of this initial evaluation:

- I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION 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 revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
For

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>I. AESTHETICS.</b>				
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

The proposed rule amendments affect heaters with a heat input of 2 mmBtu/hr or more. These types of heaters are most often found in industrial, institutional and commercial applications. Rule amendments for heaters are expected to be located in commercial or industrial areas throughout the Bay Area. Scenic highways or corridors are generally not located in the vicinity of commercial or industrial areas.

## Regulatory Background

Visual resources are generally protected by the City and/or County General Plans through land use and zoning requirements.

## Discussion of Impacts

**I a-d.** The proposed amendments to Regulation 9-7 would further reduce NO<sub>x</sub> emissions from natural gas-fired heaters in order to reduce ozone levels in the Bay Area and reduce transport of air pollutants to neighboring air basins. The proposed amendments are not expected to require the construction of any major new structures that would be visible to areas outside of the affected facilities, and are not expected to result in any adverse aesthetic impacts. Once completed, most of the modifications are not expected to be visible as they would involve new burners and or FGR which would not be visible to surrounding areas. Most of the heaters affected by the proposed rule amendments are expected to be located with industrial or commercial areas, which are not typically located in areas with scenic vistas. The proposed amendments to Regulation 9-7 are not expected to require substantial construction of any major new structures that would be visible to areas outside of the facilities, and are not expected to result in adverse aesthetic impacts. A few facilities (an estimated seven) may require new air pollution control equipment such as SCR or SNCR which could be visible to surrounding areas. Once completed, most of the modifications are not expected to be visible. Therefore, the installation of new equipment is not expected to generate significant adverse impacts on aesthetics. The proposed amendments to Regulation 9-7 would also not require any new sources of light or glare, since new equipment would largely replace existing equipment.

Based upon these considerations, no significant adverse aesthetic impacts are expected from the implementation of the amendments to Regulation 9-7.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**II. AGRICULTURE RESOURCES.**

In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) | Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) | Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Setting**

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Some of these agricultural lands are under Williamson Act contracts.

The areas with heaters affected by the proposed rule amendments are primarily located in industrial, institutional, or commercial areas throughout the Bay Area. Agricultural resources are generally not located in the vicinity of industrial, institutional or commercial areas.

**Regulatory Background**

Agricultural resources are generally protected by the City and/or County General Plans, Community Plans through land use and zoning requirements, as well as any applicable specific plans, ordinances, local coastal plans, and redevelopment plans.

## Discussion of Impacts

**II a-c.** The proposed amendments to Regulation 9-7 would further reduce NO<sub>x</sub> emissions from natural gas-fired heaters in order to reduce ozone levels in the Bay Area and reduce transport of air pollutants to neighboring air basins. Most facilities are expected to comply with Regulation 9-7 by using either low NO<sub>x</sub> burners, flue gas recirculation, or both, thus reducing combustion temperatures which reduces the production of NO<sub>x</sub>. Some of the largest heaters would require SCR. The proposed amendment will require installation of new units which use these technologies and replacement of or retrofitting old units. These changes would be made within existing structures, or in new structures which are being built within approved parcels controlled by a General Plan. No development outside of existing facilities would be required by the proposed amendments to Regulation 9-7.

Based upon these considerations, no significant adverse impacts to agricultural resources are expected from the implementation of the proposed rule amendments.

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
--	--------------------------------	---	------------------------------	-----------

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### III. AIR QUALITY

When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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## Setting

### Meteorological Conditions

The summer climate of the West Coast is dominated by a semi-permanent high centered over the northeastern Pacific Ocean. Because this high pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus the conditions that persist along the coast of California during summer are a northwest air flow and negligible precipitation. A thermal low pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

In winter, the Pacific High weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. During the winter rainy periods, inversions are weak or nonexistent, winds

are often moderate and air pollution potential is very low. During winter periods when the Pacific high becomes dominant, inversions become strong and often are surface based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog.

### **Topography**

The San Francisco Bay Area is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays. Elevations of 1,500 feet are common in the higher terrain of this area. Normal wind flow over the area becomes distorted in the lower elevations, especially when the wind velocity is not strong. This distortion is reduced when stronger winds and unstable air masses move over the areas. The distortion is greatest when low level inversions are present with the surface air, beneath the inversion, flowing independently of the air above the inversion.

### **Winds**

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate produces a jet that sweeps eastward but widens downstream producing southwest winds at Berkeley and northwest winds at San Jose; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Carquinez Strait, the Golden Gate, or San Bruno Gap.

In winter, the Bay Area experiences periods of storminess and moderate-to-strong winds and periods of stagnation with very light winds. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon and otherwise light and variable winds.

### **Temperature**

In summer, the distribution of temperature near the surface over the Bay Area is determined in large part by the effect of the differential heating between land and water surfaces. This process produces a large-scale gradient between the coast and the Central Valley as well as small-scale local gradients along the shorelines of the ocean and bays. The winter mean temperature high and lows reverse the summer relationship; daytime variations are small while mean minimum nighttime temperatures show large differences and strong gradients. The moderating effect of the ocean influences warmer minimums along the coast and penetrating the Bay. The coldest temperatures are in the sheltered valleys, implying strong radiation inversions and very limited vertical diffusion.

## **Inversions**

A primary factor in air quality is the mixing depth, i.e., the vertical dimension available for dilution of contaminant sources near the ground. Over the Bay Area, the frequent occurrence of temperature inversions limits this mixing depth and consequently limits the availability of air for dilution. A temperature inversion may be described as a layer or layers of warmer air over cooler air.

## **Precipitation**

The San Francisco Bay Area climate is characterized by moderately wet winters and dry summers. Winter rains (December through March) account for about 75 percent of the average annual rainfall; about 90 percent of the annual total rainfall is received in November to April period; and between June and September, normal rainfall is typically less than 0.10 inches. Annual precipitation amounts show greater differences in short distances. Annual totals exceed 40 inches in the mountains and are less than 15 inches in the sheltered valleys.

## **Pollution Potential**

The Bay Area is subject to a combination of physiographic and climatic factors which result in a low potential for pollutant buildups near the coast and a high potential in sheltered inland valleys. In summer, areas with high average maximum temperatures tend to be sheltered inland valleys with abundant sunshine and light winds. Areas with low average maximum temperatures are exposed to the prevailing ocean breeze and experience frequent fog or stratus. Locations with warm summer days have a higher pollution potential than the cooler locations along the coast and bays.

In winter, pollution potential is related to the nighttime minimum temperature. Low minimum temperatures are associated with strong radiation inversions in inland valleys that are protected from the moderating influences of the ocean and bays. Conversely, coastal locations experience higher average nighttime temperatures, weaker inversions, stronger breezes and consequently less air pollution potential.

## **Air Quality**

### **Criteria Pollutants**

It is the responsibility of the BAAQMD 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 (NO<sub>2</sub>), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>) 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. 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 3-1. The BAAQMD monitors levels of various criteria pollutants at 24 monitoring stations. The 2006 air quality data from the BAAQMD's monitoring stations are presented in Table 3-2.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically (see Table 3-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NO<sub>x</sub>), and sulfur dioxides (SO<sub>2</sub>). The Air District is not considered to be in attainment with the State PM<sub>10</sub> and PM<sub>2.5</sub> standards.

The 2006 air quality data from the BAAQMD monitoring stations are presented in Table 3-2. All monitoring stations were below the state standard and federal ambient air quality standards for CO, NO<sub>2</sub>, and SO<sub>2</sub>. The federal 8-hour ozone standard was exceeded 12 days in the District in 2006, while the state standard was exceeded on 22 days. The Bay Area is designated as a non-attainment area for the California 1-hour ozone standard. The State 1-hour ozone standard was exceeded on 18 days in 2006 in the District, most frequently in the Eastern District (Livermore) (see Table 3-2).

All monitoring stations were in compliance with the federal PM<sub>10</sub> standards. The California PM<sub>10</sub> standards were exceeded on 15 days in 2006, most frequently in San Jose. The Air District exceeded the federal PM<sub>2.5</sub> standard on ten days, most frequently in San Jose, in 2006 (see Table 3-2).

**TABLE 3-1**

**Federal and State Ambient Air Quality Standards**

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.075 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(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; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(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; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 µg/m <sup>3</sup> , annarithmic mean > 50 µg/m <sup>3</sup> , 24-hr average>	50 µg/m <sup>3</sup> , annual arithmetic mean > 150 µg/m <sup>3</sup> , 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 µg/m <sup>3</sup> , annual arithmetic mean>	15 µg/m <sup>3</sup> , annual arithmetic mean> 35 µg/m <sup>3</sup> , 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m <sup>3</sup> , 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m <sup>3</sup> , 30-day avg. >=	1.5 µg/m <sup>3</sup> , calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

**TABLE 3-2  
Bay Area Air Pollution Summary - 2006**

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM <sub>10</sub>				PM <sub>2.5</sub>					
	Max 1-hr	Cal Days	Max 8-hr	Nat Days	Cal Days	3-Yr Avg	Max 1-hr	Max 8-hr	Nat/Cal Days	Max 24-hr	Ann Avg	Nat/Cal Days	Max 24-hr	Ann Avg	Nat/Cal Days	Ann Avg	Max 24-hr	Nat Days	Cal Days	Max 24-hr	Nat Days	3-Yr Avg	Ann Avg	3-Yr Avg	
<b>North Counties</b>	(ppb)						(ppm)			(ppb)			(ppb)			(µm <sup>3</sup> )				(µm <sup>3</sup> )					
Napa	96	1	72	0	2	60	3.5	2.8	0	3.5	11	0	-	-	-	21.9	52	0	1	-	-	-	-	-	-
San Rafael	89	0	58	0	0	50	2.6	1.5	0	2.6	14	0	-	-	-	18.1	68	0	1	-	-	-	-	-	-
Santa Rosa	77	0	58	0	0	47	2.4	1.7	0	2.4	11	0	-	-	-	18.8	90	0	2	59.0	1	28.7	9.2	8.3	
Vallejo	80	0	69	0	0	57	3.7	2.9	0	3.7	12	0	4	1.0	0	19.8	50	0	0	42.2	1	35.6	9.8	10.2	
<b>Coast/Central Bay</b>																									
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	6	1.6	0	-	-	-	-	-	-	-	-	-	-
San Francisco	53	0	46	0	0	45	2.7	2.1	0	107	16	0	6	1.3	0	22.9	61	0	3	54.3	3	30.9	9.7	9.7	
San Pablo	61	0	50	0	0	48	2.5	1.4	0	55	13	0	5	1.6	0	21.3	62	0	2	-	-	-	-	-	
<b>Eastern District</b>																									
Bethel Island	116	9	90	1	14	73	1.3	1.0	0	44	8	0	7	2.1	0	19.4	84	0	1	-	-	-	-	-	
Concord	117	8	92	4	14	74	1.7	1.3	0	47	11	0	7	0.8	0	18.5	81	0	3	62.1	5	35.0	9.3	9.7	
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	8	1.8	0	-	-	-	-	-	-	-	-	-	
Fairfield	106	3	87	1	8	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Livermore	127	13	101	5	15	80	3.3	1.8	0	64	14	0	-	-	-	21.8	69	0	3	50.8	3	33.5	9.8	9.7	
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	7	1.9	0	-	-	-	-	-	-	-	-	-	
Pittsburg	105	3	93	1	10	70	3.3	1.9	0	52	11	0	9	2.4	0	19.9	59	0	2	-	-	-	-	-	
<b>South Central Bay</b>																									
Fremont	102	4	74	0	3	60	2.9	1.8	0	63	15	0	-	-	-	20.0	57	0	1	43.9	2	30.3	10.3	9.6	
Hayward	101	2	71	0	1	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Redwood City	85	0	63	0	0	53	5.5	2.4	0	69	14	0	-	-	-	19.8	70	0	2	75.3	1	29.4	9.6	9.2	
San Leandro	88	0	66	0	0	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Santa Clara Valley</b>																									
Gilroy	120	4	101	2	8	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Los Gatos	116	7	87	4	11	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
San Jose Central	118	5	87	1	5	63	4.1	2.9	0	74	18	0	-	-	-	21.0	73	0	2	64.4	6	38.5	10.8	11.4	
San Jose, Tully Rd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35.0	106	0	13	30.6	0	-	-	-	
San Martin	123	7	105	5	11	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sunnyvale	106	3	78	0	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Total Days over Standard</b>		<b>18</b>		<b>12</b>	<b>22</b>				<b>0</b>			<b>0</b>			<b>0</b>			<b>0</b>	<b>15</b>		<b>10</b>				

(ppm) = parts per million, (pphm) = parts per hundred million, (ppb) = parts per billion

**TABLE 3-3**  
**Bay Area Air Quality Summary**  
**Days over standards**

YEAR	OZONE		CARBON MONOXIDE				NO <sub>x</sub>	SULFUR DIOXIDE		PM10		PM2.5	
	1-Hr		8-Hr		1-Hr		8-Hr		1-Hr	24-Hr		24-Hr*	24-Hr**
	Nat	Cal	Nat	Cal	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat	
1995	11	28	-	0	0	0	0	0	0	0	0	7	-
1996	8	34	-	0	0	0	0	0	0	0	0	3	-
1997	0	8	-	0	0	0	0	0	0	0	0	4	-
1998	8	29	16	0	0	0	0	0	0	0	0	5	-
1999	3	2	9	0	0	0	0	0	0	0	0	12	-
2000	3	12	4	0	0	0	0	0	0	0	0	7	1
2001	1	15	7	0	0	0	0	0	0	0	0	10	5
2002	2	16	7	0	0	0	0	0	0	0	0	6	5
2003	1	19	7	0	0	0	0	0	0	0	0	6	0
2004	0	7	0	0	0	0	0	0	0	0	0	7	1
2005	0	9	1	0	0	0	0	0	0	0	0	6	0
2006	0	18	12	0	0	0	0	0	0	0	0	15	10

\* PM10 is sampled every sixth day – actual days over standard can be estimated to be six times the numbers listed.  
 \*\* 2000 is the first full year for which the Air District measured PM2.5 levels.

**Toxic Air Pollutants**

Table 3-4 (BAAQMD, 2007) contains a summary of ambient air toxics monitoring data of TACs measured at monitoring stations in the Bay Area by the District in 2003.

**Regulatory Background**

**Criteria Pollutants**

At the federal level, the Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California’s air districts, including the BAAQMD, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

**TABLE 3-4**

**Summary of 2003 BAAQMD Ambient Air Toxics Monitoring Data**

Compound	LOD (ppb) <sup>(1)</sup>	% of Samples < LOD <sup>(2)</sup>	Max. Conc. (ppb) <sup>(3)</sup>	Min. Conc. (ppb) <sup>(4)</sup>	Mean Conc. (ppb) <sup>(5)</sup>
Acetone	0.30	0	121.4	0.6	6.80
Benzene	0.10	1.78	2.4	0.5	0.401
1,3-butadiene	0.15	75.7	0.89	0.075	0.12
Carbon tetrachloride	0.01	0	0.16	0.09	0.108
Chloroform	0.02	62.5	1.47	0.01	0.024
Ethylbenzene	0.10	44.2	0.90	0.05	0.135
Ethylene dibromide	0.02	100	0.01	0.01	0.01
Ethylene dichloride	0.10	100	0.05	0.05	0.05
Methylene chloride	0.50	82.9	3.40	0.25	0.356
Methyl ethyl ketone	0.20	7.7	5.80	0.1	0.496
Metyl tert-butyl ether	0.30	32.9	4.80	0.15	0.532
Perchloroethylene	0.01	42.4	0.28	0.005	0.026
Toluene	0.10	0.2	6.0	0.05	1.062
1,1,1-Trichloroethane	0.05	72.3	2.47	0.025	0.084
Trichloroethylene	0.05	93.8	0.33	0.025	0.029
Trichlorofluoromethane	0.01	0	.046	0.18	0.266
1,1,2-trichlorotrifluoroethane	0.01	0	1.16	0.06	0.077
Vinyl chloride	0.30	100	0.15	0.15	0.15
m/p-xylene	0.10	2.8	3.40	0.05	0.535
o-xylene	0.10	27.9	1.30	0.05	0.186

**NOTES:** Table 3-4 summarizes the results of the BAAQMD gaseous toxic air contaminant monitoring network for the year 2003. These data represent monitoring results at 19 of the 20 separate sites at which samples were collected. Data from the Fort Cronkhite "clean-air" background site was not included. Data from the Oakland-Davie Stadium site was available from January through March.

- (1) "LOD" is the limit of detection of the analytical method used.
- (2) "% of samples < LOD" is the percent of the total number of air samples collected in 2003 that had pollutant concentrations less than the LOD.
- (3) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.
- (4) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites.
- (5) "Mean Conc." is the arithmetic average of the air samples collected in 2003 at the 19 monitoring sites. In calculating the mean, samples with concentrations less than the LOD were assumed to be equal to one half the LOD concentration.

The BAAQMD is governed by a Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties in accordance with California Health and Safety Code section 40221. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The BAAQMD is responsible for implementing emissions standards and other requirements of federal and state laws. It is also responsible for developing air quality planning documents required by both federal and state laws.

**Toxic Air Contaminants**

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific National Emission Standards for Hazardous Air Pollutants (NESHAPs) were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards must be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed three regulatory programs for the control of TACs. Each of the programs is discussed 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 Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), 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. Since adoption of the program, CARB has identified 18 TACs, and CARB adopted a regulation designating all 189 federal HAPs as TACs.

**Control of TACs Under the Air Toxics "Hot Spots" Act:** The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656) 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 those emissions. Inventory reports must be updated every four years under current state law. The BAAQMD uses a maximum individual cancer risk of 10 in one million, or an ambient concentration above a non-cancer reference exposure level, as the threshold for notification.

Senate Bill (SB) 1731, enacted in 1992 (California Health and Safety Code §44390 et seq.), amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. At a minimum, such facilities must, as quickly as feasible, reduce cancer risk levels that exceed 100 per one million. The BAAQMD adopted risk reduction requirements for perchloroethylene dry cleaners to fulfill the requirements of SB 1731.

**Targeted Control of TACs Under the Community Air Risk Evaluation Program:** In 2004, BAAQMD established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, BAAQMD will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs,

community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

## Discussion of Impacts

**III a.** Regulation 9-7 was adopted pursuant to the region's first plan prepared under the CCAA's ozone planning requirements, the Bay Area 1991 Clean Air Plan (CAP). The objectives of the proposed rule amendments are to implement Control Measure SS-12 from the Bay Area 2005 Ozone Strategy in order to help reduce NO<sub>x</sub> emissions from industrial, institutional, and commercial boilers, steam generators and process heaters and make Regulation 9-7 more stringent. Because the proposed amendments directly implement the control measure, the proposed amendments are in compliance with the local air quality plan and are expected to provide beneficial impacts associated with implementation of the local air quality plan

**III b, c, d, and f.** Regulation 9-7 was adopted pursuant to the regions's first plan prepared under the CCAA's ozone planning requirements, the Bay Area 1991 Clean Air Plan (CAP). Regulation 9-7 was adopted on September 16, 1992. Control Measure SS-12 in the Bay Area 2005 Ozone Strategy required the BAAQMD to determine if further reductions in NO<sub>x</sub> emissions from natural gas-fired heaters was feasible. Emissions from industrial, institutional, and commercial boilers, steam generators and process heaters include all the products of combustion. The primary concern with emissions from these boilers, steam generators and process heaters in the Bay Area is NO<sub>x</sub>. Industrial, institutional, and commercial boilers, steam generators and process heaters also produce CO, SO<sub>x</sub>, ROG, and PM10 emissions, but the contribution from boilers, steam generators and process heaters for each is relatively insignificant in the total emission inventory for the Bay Area, so no changes are being considered for pollutants other than NO<sub>x</sub>.

Combustion in industrial, institutional, and commercial boilers, steam generators and process heaters also produces CO<sub>2</sub>, a growing concern with respect to climate change. NO<sub>x</sub> is formed from combustion of nitrogen in the fuel (fuel NO<sub>x</sub>), but the primary source of NO<sub>x</sub> is from the oxidation of nitrogen in the air (thermal NO<sub>x</sub>).

**NO<sub>x</sub>:** The Bay Area is not yet in attainment of state ozone standards, so the region must implement all feasible measures to reduce the pollutants that form ozone (NO<sub>x</sub> and ROG). Control Measure SS-12 of the Air District's 2005 Ozone Strategy included consideration of amendments to Regulation 9, Rule 7: *Nitrogen Oxides and Carbon Monoxides from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters*. If adopted as proposed, Regulation 9-7 would regulate NO<sub>x</sub> emissions from all heaters boilers with heat ratings greater than 2 mmBtu/hr. The emissions from newly regulated heaters would be reduced by approximately 1.36 tons/day, and the emissions from currently controlled heaters by about 1.75 tons/day, for a total of approximately 3.1 tons/day of NO<sub>x</sub> reduced, providing an environmental benefit.

**CO Emissions:** CO is produced by the incomplete oxidation of carbon in a fossil fuel to CO rather than to carbon dioxide. Because the Air District is in attainment status with all state and federal ambient air quality standards for CO, Regulation 9-7 attempts to limit the concentration of CO in the exhaust stream of combustion processes to a reasonable level (400 ppmv), but does not attempt to achieve further CO emission reductions. All other California air districts that address CO emissions from combustion sources impose the same standard. The most common NO<sub>x</sub> control strategies, which limit NO<sub>x</sub> formation by limiting combustion temperature, tend to also limit complete oxidation of carbon to carbon dioxide, thereby increasing the CO formation rate. In order to maintain CO emission levels below 400 ppm, no control

technology is required. Instead, the NO<sub>x</sub> control technology must be implemented in a way that does not result in an excessive CO formation rate.

**Greenhouse Gas Emissions:** It is widely accepted that the accumulation of increasing amounts of greenhouse gases (GHG) in the Earth's atmosphere is a cause of global warming and may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project. The proposed amendments to Regulation 9, Rule 7 would extend the rule to apply to certain classes of heaters currently not regulated in the District and would generally make the emission limits in the rule more stringent. The proposed amendments also include requirements to maximize energy efficiency among heaters that would be subject the rule. The net effect the proposed amendments would have on GHG emissions will depend upon the technologies applied to meet the new emissions limits and on the effect of the energy efficiency measures proposed in the rule. As explained below, the proposed amendments to Regulation 9, Rule 7 are not anticipated to result in an increase in emissions of GHG.

Combustion of conventional hydrocarbon fuel results in the release of energy as bonds between carbon and hydrogen are broken and reformed with oxygen to create water vapor and CO<sub>2</sub>. CO<sub>2</sub> is not a pollutant that occurs in relatively low concentrations as a by-product of the combustion process; CO<sub>2</sub> is a necessary combustion product of any fuel containing carbon. Therefore, attempts to reduce emissions of greenhouse gases from combustion focus on increasing energy efficiency – consuming less fuel to provide the same useful energy output. Boilers generally operate at no more than 85 percent overall efficiency (i.e. only up to 85 percent of the heat value of the fuel that is consumed is transferred to the material that is being heated and the other 15 percent is released to the atmosphere as waste heat). Waste heat is released in three ways:

- as heat in the combustion exhaust which is released from the boiler stack;
- as radiant heat from the outside of the boiler because the boiler is not perfectly insulated;
- or as heat in the liquid “blowdown” stream that is constantly drained from the boiler to prevent solids from concentrating inside the boiler and ultimately fouling the heat exchange surfaces.

The most significant of these factors is heat loss through the boiler stack. Stack losses may be minimized by minimizing the amount of excess air and, therefore, the amount of oxygen and nitrogen that is heated and released from the stack. Reducing excess air to the minimum level necessary for complete fuel combustion, with a reasonable safety margin, is a very effective way to control NO<sub>x</sub> emissions. In addition, boiler efficiency may be improved by limiting liquid blowdown to the lowest necessary level, by improving boiler shell insulation, and by maintaining clean boiler internals to maximize heat transfer to the medium being heated rather than to the atmosphere through the boiler stack.

The proposed amendments include measures to maximize the energy efficiency of heaters that would be subject the rule. First, the proposed amendments include a requirement to install insulation on most heaters subject to the rule, with some safety related exceptions, such that exposed surfaces do not exceed 140 degrees Fahrenheit. In addition, the proposed amendments to Regulation 9-7 include an annual tune-up requirement for most heaters subject to the rule, effective in 2009. Finally, the proposed amendments require good heat transfer by setting maximum limits on stack gas temperatures, from 100 to 150 degrees Fahrenheit over the saturated steam or hot water temperature.

Apart from the energy efficiency measures described above, the proposed amendments would affect GHG emissions depending on the means used by heater operators to comply with the proposed emission

limitations. For the proposed NO<sub>x</sub> emission limits affecting heaters rated from 2 up to 20 MM BTU/hr, and for units rated 75 MM BTU/hr and above, a significant overall loss in efficiency is not expected. In fact, better air-fuel controls on heaters that are required to maintain low NO<sub>x</sub> levels will increase efficiency in most heaters affected by the proposed amendments.

For some heaters, installation of ultra low-NO<sub>x</sub> burners in conjunction with fuel-gas recirculation (FGR) may require that the maximum firing capacity of the heater be reduced or may result in an overall loss of efficiency. The heaters most likely to require both these technologies are in the 20 to 75 MM BTU/hr range. The proposed amendments would subject each heater in this range to a NO<sub>x</sub> emission limit of 9 ppmv, unless the heater is a load-following unit, as defined in the amendments. Under the proposed amendments, load-following units would be subject to a 15 ppmv NO<sub>x</sub> emission limit. Heaters subject to the proposed 9 ppmv NO<sub>x</sub> limit may install ultra low-NO<sub>x</sub> burners in conjunction with FGR, whereas heaters subject to a 15 ppmv limit would be unlikely to utilize FGR. In the District, there are 125 heaters rated between 20 to 75 MM BTU/hr, though many may be subject to the proposed 15 ppmv NO<sub>x</sub> emission limit rather than the 9 ppmv NO<sub>x</sub> emission limit because they are load-following units. The 20 to 75 MMBTU/hr heaters with ultra-low NO<sub>x</sub> burners and flue gas recirculation may require up to 40% of the flue gas to be re-circulated. However, one burner manufacturer states that, with state-of-the-art controls, no more than 15% of flue gas would need to be re-circulated to achieve NO<sub>x</sub> emissions lower than 9 ppmv.<sup>1</sup> Other boiler and burner manufacturers state that 9 ppmv can be achieved in new heater designs without loss of efficiency.<sup>23</sup> Finally, applications are being developed for combined heat and power units, wherein a microturbine provides combustion air and power to run elements of the NO<sub>x</sub> control system, resulting in an overall net energy decrease. One such system is slated for installation at Hitachi Systems in the Bay Area.<sup>4</sup> Re-circulation of 40% of the flue gas would result in about a 10% loss in overall heater efficiency. If all heaters in this size range were to suffer a 10% loss in efficiency, there would be an increase in CO<sub>2</sub> of 565 tons per day. Re-circulation of 15% of the flue gas would result in less than 5% loss in efficiency.

The energy efficiency measures in the proposed amendments will improve energy efficiency across the entire range of heaters, reducing greenhouse gases. The proposed energy efficiency measures are:

- Insulation requirements for all heaters, such that surfaces, including pipes and ducts, do not exceed 120°F, with some exceptions, to reduce heat loss to the atmosphere;
- Stack gas temperature limits, to ensure good heat transfer within the boiler; and
- Tune-up requirements, to maintain optimal air-fuel ratios.

Insulation can increase energy efficiency in a heater by up to 5%. Over time, insulation degrades, or is removed for heater repairs and servicing and not replaced. Some heaters have inadequate insulation and older heaters may never have been insulated. If all heaters were to be able to increase energy efficiency by 5%, CO<sub>2</sub> emissions would be decreased by 2781 tons per day. Hot stack gas temperatures is an indication of poor heat transfer within the heaters, either as a result of insufficient opportunity for the transference of heated air to water, steam or process fluid; or fouled or corroded heat transfer surfaces. In the first case, heater design is at fault; a replacement heater or the addition of an economizer will improve heat transfer. In

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<sup>1</sup> Weideman, Dan, Demonstration of an Ultralow NO<sub>x</sub> Burner on a Firetube Boiler, ST Johnson Co., Jan.12, 2004, [http://www.johnstonboiler.com/fir\\_burner.php](http://www.johnstonboiler.com/fir_burner.php)

<sup>2</sup> Connor, S. "Low Emissions and High Efficiency, A Dichotomy?", Cleaver-Brooks, <http://www.cbboilers.com/Emissions/Technical%20Articles/Efficiency.%20a%20dichotomy%20S%20Connor.pdf>

<sup>3</sup> Delta-NO<sub>x</sub> Ultra Low NO<sub>x</sub> Burner Achieves 9 PPM, Coen Company, Inc. July 2005

<sup>4</sup> Castaldini, Carlo, CMC Engineering, telephone conversation and Industrial Technologies Program/Energy Efficiency and Renewable Energy, [www1.eere.energy.gov/industry/bestpractices/pdfs/steam3\\_recovery.pdf](http://www1.eere.energy.gov/industry/bestpractices/pdfs/steam3_recovery.pdf)

the second, cleaning the heat transfer surfaces and maintaining an optimal liquid blowdown rate to keep the transfer surfaces clean will improve heat transfer and lower stack gas temperatures. As a rule of thumb, 1% in overall heater efficiency can be gained for every 40°F reduction in flue gas. Tune-up requirements can increase heater efficiency by up to 10% by optimizing air-fuel ratios. This also ensures that NO<sub>x</sub> emissions are not increasing beyond the proposed limits. A tune-up will also check blowdown rates, so that heat is not lost from overly frequent blowdowns. If all heaters in the smallest size range, 2 to 10 MM BTU/hr, could increase their efficiency by 10%, CO<sub>2</sub> emissions would be decreased by 4809 tons per day.

It is difficult to assess the overall greenhouse gas impacts of the energy efficiency measures, which reduce CO<sub>2</sub>, and the proposed NO<sub>x</sub> limit for the 20 to 75 MM BTU/hr size category, which may increase CO<sub>2</sub>. The reason for this difficulty is that the number of heaters that will opt for the ultra-low NO<sub>x</sub> burners in conjunction with high flue gas recirculation is unknown because a considerable number are expected to be load-following units, some may opt for SCR, which does not significantly reduce energy efficiency, and some may install advanced controls that may limit the amount of flue gas recirculation needed. Also, the number of heaters that will need insulation is unknown. Most heaters are installed with insulation, but, over time, insulation degrades, and repair or replacement of old insulation could be of considerable value. Finally, the number of heaters that do not now receive annual tune-ups, and thus would benefit from the tune-up requirement, is unknown.

It is likely that the reduction in greenhouse gases from energy efficiency measures, overall, far outweighs a possible increase in greenhouse gases from NO<sub>x</sub> control equipment in the 20 to 75 MM BTU/hr size category. Air district staff developed a spreadsheet to calculate overall increases or reductions in CO<sub>2</sub> from the proposed amendments based on numbers of heaters that would require insulation and tune-ups, and numbers in the 20 to 75 MM BTU/hr range that would suffer an energy efficiency loss. Staff used a 10% reduction in efficiency for the 20 to 75 MM BTU/hr heaters, a 5% benefit from insulating heaters, and a 10% benefit from tune-ups to heaters. For the purposes of the calculations, staff only input benefit from tune-ups to the smallest size heaters, those in the 2 to 10 MM BTU/hr range. These are the heaters most likely to be in institutional or commercial use, or in places like apartment buildings, office buildings and hotels. The large heaters tend to be in industrial use and staff assumed that, because fuel usages are so great, they would be more likely to be tuned up at least annually. PG&E estimates a 10% to 20% energy efficiency increase from tune-ups, so the 10% benefit used for the calculation is conservative. Also, a variety of sources estimates that insulation can improve a heater's efficiency by 5% to 10%. Five percent has been used for these calculations. All heaters were input at their reported fuel usages, as derived from assumptions made from the District's permitted heater database.

The calculations show that, if 90% of the heaters are already insulated with insulation that has not degraded due to age, and if 90% of the heaters in the smallest size range already have annual tune-ups (as noted above, the calculations assume all larger heaters are tuned up annually), and all the 20 to 75 MM BTU/hr heaters suffer a 10% energy efficiency loss, then there would still be a net CO<sub>2</sub> reduction of 194 tons per day. It is likely that the net reduction of greenhouse gases are much greater, for the reasons described below.

First, based on information gathered from boiler service companies in the District, it is unlikely that 90% of heaters in the District are adequately insulated. Rather, most heaters have had insulation degradation, as described above, so that the majority of heaters could benefit from upgrading insulation.

Second, it is also unlikely that 90% of all heaters have annual inspection and maintenance (tune-ups). Although heaters are inspected periodically for safety, and insurance companies require these inspections, air-fuel optimization is not necessarily a part of these inspections. Many operators in the commercial service sector will not tune-up to maximize efficiency routinely, although larger operators will. The District regularly inspects, and conducts source tests on, heaters rated equal to or greater than 10 MM BTU/hr. In the District’s experience, larger units are more likely to be tuned up. However, the effectiveness of air-fuel controllers varies among heaters; generally, newer units equipped with digital controls can more precisely measure air/fuel mixtures, resulting in greater efficiency, than can mechanical controls typically found on older units.

It is probable that the assumption of a 10% energy efficiency reduction from all heaters in the 20 – 75 MM BTU/hr size range is an over-estimate because it is unlikely that all these heaters will suffer a 10% loss in efficiency. As discussed above, technology is available to reduce the energy efficiency loss in this size range. At current high energy costs, it is reasonable to assume that this technology would become more economically attractive. The proposed NOx limit could also be met with other technology, such as SCR. SCR, while generally more expensive than ultra-low NOx burners and FGR, does not significantly degrade efficiency. Finally, a number of heaters are likely load-following units, so would be subject to a less stringent standard.

Researchers are developing what are known as Super Boilers.<sup>5</sup> These devices, currently in the testing stage, have shown energy efficiencies of 94% and NOx emissions of less than 5 ppmv. These technologies should be available as the proposed amendments become mandatory. Operators who choose this technology could ultimately see cost savings over retrofitting and further reduce greenhouse gas emissions.

Table 3-5 shows a range of expected CO<sub>2</sub> reductions from various percentages of heaters that are able to gain energy efficiency if all the 20 to 70 MM BTU/hr heaters were to suffer a 10% energy efficiency loss.

**Table 3-5**

**CO2 Reductions from Insulation and Small Boiler Tune-Ups Including Efficiency Loss, 20 – 75 MM BTU/hr Heaters, Tons/day**

Percent heaters already insulated	Percentage of heaters that already get annual tune-ups		
	50% already get annual tune-ups	75% already get annual tune-ups	90% already get annual tune-ups
10% insulated	4342	3140	2418
25% insulated	3925	2723	2001
50% insulated	3230	2027	1306
75% insulated	2534	1332	611
90% insulated	2117	915	194

<sup>5</sup> US Department of Energy, Energy Efficiency and Renewable Energy, Super Boiler, First Generation, Ultra-High Efficiency Firetube Boiler, June, 2007, <http://www1.eere.energy.gov/industry/combustion/pdfs/spperboiler.pdf>

Finally, the proposed amendments to Regulation 9-7 are expected to require the addition of SCR on an estimated seven facilities with larger heaters. The energy requirements for the use of SCR units is limited to new air blowers, pumps, and a vaporization unit which have relatively small motors (about 100 horsepower) (SCAQMD, 2008 and SCAQMD, 2004). SCR units is only expected to be installed at seven industrial facilities that already use electricity and the increase in energy use at these facilities and related greenhouse gas emissions are expected to be negligible.

Therefore, the proposed energy efficiency requirements (insulation, stack gas temperature maxima and tune-ups of heaters) included as part of the amendments to Regulation 9-7 are expected to reduce greenhouse gas emissions to a greater extent than the minimal additional energy use associated with add-on control equipment is expected to increase energy usage.

Based on the above discussion, implementation of the proposed amendments to Regulation 9-7 is expected to result in overall reductions in NO<sub>x</sub> emissions and no increase in emissions of other air pollutants. The proposed rule amendments would not require increased firing of heaters, boilers and steam generators; therefore, no increases in VOC, PM<sub>10</sub>, SO<sub>x</sub> or greenhouse gas emissions are expected. The proposed rule amendment allows an operator to comply with the new standards, at least in part, through energy efficiency, therefore, incentives have been provided that may result in a reduction in emissions of other air pollutants. Based on the above, no significant adverse air quality impacts are expected due to implementation of the proposed rule amendments.

**Secondary Particulate Emissions:** Although most facilities are expected to comply with the proposed amendments to Regulation 9-7 through installation of low NO<sub>x</sub> burners and/or FGR, the use of SCR control equipment is also feasible to reduce control equipment to reduce NO<sub>x</sub> emissions has become a widespread method of complying with SCAQMD NO<sub>x</sub> control rules. SCR technology uses ammonia as a catalyst. The SCAQMD has reviewed SCR technology in a number of CEQA documents (e.g., Final EIR for Rule 1135, August 1989, SCH No. 88032315 and Final EIR for Rule 1134, August 1989, SCH No. 86121708). The SCAQMD has evaluated potential air quality impacts resulting from secondary particulate formation from ammonia slip emissions. The SCAQMD concluded in the CEQA documents identified above that secondary particulate formation from ammonia slip would not be considered a significant adverse air quality impact if ammonia slip is limited to 10 ppm or less.

Ammonia slip depends on a variety of factors including space velocity, ammonia to NO<sub>x</sub> molar ratio, temperature, and NO<sub>x</sub> inlet concentration. Better technology has allowed operators to control ammonia slip: (1) by ensuring adequate mixing of ammonia in the flue gas to maintain uniform ammonia injection; (2) maintaining the proper ammonia to NO<sub>x</sub> molar ratio; (3) decreasing the exhaust gas flow rate; (4) maintaining consistent exhaust velocity, and maintaining an optimal temperature regime (SCAQMD, 1990). The potential for secondary particulate emissions can be alleviated by limiting ammonia slip to no more than 10 ppm, which will minimize the potential for secondary particulate formation to less than significant. In addition, NO<sub>x</sub> reductions may also reduce ambient levels of fine particulate matter (PM<sub>2.5</sub>) pollution, because a fraction of NO<sub>x</sub> emissions is ultimately converted to nitrate particles in the atmosphere. It is estimated that the reduction in NO<sub>x</sub> will reduce the formation of secondary particulate matter by 0.5 tons/day. The use of SCR to comply with the proposed amendments to Regulation 9-7 is expected to be limited to seven facilities so that limiting the ammonia slip to 10 ppm or less is expected to limit the potential for secondary particulate emission formation to less than significant, and will be more than offset by the reduction in secondary PM.

Based on the above discussion, implementation of the proposed amendments to Regulation 9-7 is expected to result in overall reductions in NO<sub>x</sub> and PM<sub>2.5</sub> and no increase in emissions of GHG and other air pollutants. The proposed rule amendments would not require increased firing of heaters, boilers and steam generators; therefore, no increases in VOC, PM<sub>10</sub>, or SO<sub>x</sub> emissions are expected. Based on the above, no significant adverse air quality impacts are expected due to implementation of the proposed rule amendments.

**III c.** CEQA Guidelines indicate that cumulative impacts of a project shall be discussed when the project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065(c). The overall impact of the proposed amendment to the rules is a decrease in NO<sub>x</sub> emissions. Therefore, the cumulative air quality impacts of the proposed rule amendments are expected to be beneficial.

**III d.** Although most facilities are expected to comply with the proposed amendments to Regulation 9-7 through installation of low NO<sub>x</sub> burners and/or RFG, the use of SCR control equipment is also feasible to reduce control equipment to reduce NO<sub>x</sub> emissions has become a widespread method of complying with NO<sub>x</sub> control rules. SCR technology uses ammonia as a catalyst and can potentially generate ammonia emissions through ammonia slip. Ammonia is regulated as a toxic air contaminant. However, limiting ammonia slip to 10 ppm is expected to minimize the potential exposure to sensitive receptors so that no significant impacts associated with ammonia use is expected.

**III e.** The proposed project is not expected to result in an increase in odors. The proposed amendments to Regulation 9-7 propose improved technology for reducing NO<sub>x</sub> emissions from industrial, institutional, and commercial boilers, steam generators and process heaters. Affected facilities are expected to comply by replacing or retrofitting boilers, steam generators and process heaters with low-NO<sub>x</sub> technologies. While the new technology for boilers, steam generators and process heaters will produce less NO<sub>x</sub>, they will continue to be fueled with natural gas and LPG which will not lead to any change in odors produced during operation.

Odors associated with ammonia use in new SCR systems are expected to be minimal. Ammonia can have a strong odor; however, the proposed project is not expected to generate substantial ammonia emissions. Ammonia is generally stored in an enclosed pressurized tank, which prevents fugitive ammonia emissions. Ammonia emissions from the SCR unit stack (also referred to as ammonia slip) can be minimized through permit conditions. Since exhaust emissions are buoyant as a result of being heated, ammonia will disperse and ultimate ground level concentrations will be substantially lower than five ppm. Five ppm is below the odor threshold for ammonia of 20 ppm (OSHA, 2005). Potential odor impacts associated with the proposed amendments to Regulation 9-7 are not expected to be significant. Therefore, no significantly adverse incremental odor impacts are expected due to the proposed rule amendments.

The proposed project is not expected to result in an increase in odors. The proposed amendments to Regulation 9-7 propose improved technology for reducing NO<sub>x</sub> emissions from heaters. Industrial, institutional, or commercial facilities are expected to comply by upgrading existing equipment with low NO<sub>x</sub> emitting technology. New units to be installed will be in compliance with the emission standards adopted in the proposed amendment to Regulation 9-7. While the new technology for natural gas-fired heaters will produce less NO<sub>x</sub>, they will continue to be fueled with the natural gas which will not lead to any change in odors produced during operation. Potential odor impacts from the proposed project are not expected to be significant. Therefore, no significantly adverse incremental odor impacts are expected due to the proposed rule amendments.

Based upon these considerations, the implementation of the proposed rule amendments will provide considerable air quality benefits by reducing NO<sub>x</sub> emissions and subsequent formation of ozone and by reducing secondary particulate formation. Also, no increase in greenhouse gas emissions is anticipated.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IV. BIOLOGICAL RESOURCES. Would the project:</b>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. A wide variety of biological resources are located within the Bay Area.

The areas affected by the proposed rule amendments are located in the Bay Area-Delta Bioregion (as defined by the State's Natural Communities Conservation Program). This Bioregion is comprised of a variety of natural communities, which range from salt marshes to chaparral to oak woodland. The areas affected by the proposed rule amendments are located in industrial, institutional, or commercial areas throughout the Bay Area. The affected areas have been graded to develop various industrial, institutional, or commercial structures. Native vegetation, other than landscape vegetation, has generally been removed from areas to minimize safety and fire hazards. Any new development would fall under compliance with the City or County General Plans.

## **Regulatory Background**

Biological resources are generally protected by the City and/or County General Plans through land use and zoning requirements which minimize or prohibit development in biologically sensitive areas. Biological resources are also protected by the California Department of Fish and Game, and the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service and National Marine Fisheries Service oversee the federal Endangered Species Act. Development permits may be required from one or both of these agencies if development would impact rare or endangered species. The California Department of Fish and Game administers the California Endangered Species Act which prohibits impacting endangered and threatened species. The U.S. Army Corps of Engineers and the U.S. EPA regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

## **Discussion of Impacts**

**IV a – f.** No impacts on biological resources are anticipated from the proposed rule amendments which would apply to existing or newly constructed facilities with industrial, institutional, and commercial heaters. Existing heaters will be replaced or upgraded, and new facilities will install the designated equipment required by the proposed amendments to Regulation 9-7. The existing heaters are generally located in industrial and commercial areas, which do not usually include sensitive biological species. The areas have typically been graded and developed, and biological resources, with the exception of landscape species, have generally been removed. Construction activities associated with the proposed amendments to Regulation 9-7 are expected to be limited to the boundaries of existing development and no development outside of existing facilities is expected.

Based upon these considerations, no significant adverse impacts to biological resources are expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>V. CULTURAL RESOURCES.</b> Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside a formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural and open space uses. Cultural resources are defined as buildings, sites, structures, or objects which might have historical architectural, archaeological, cultural, or scientific importance.

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. This locality lies within the San Francisco Bay and the west end of the Central Valley archaeological regions, both of which contain a rich array of prehistoric and historical cultural resources. The areas surrounding the Carquinez Strait and Suisun Bay have been occupied for millennia given their abundant combination of littoral and oak woodland resources.

The areas with natural gas-fired heaters affected by the proposed rule amendments are primarily located in industrial, institutional, or commercial areas throughout the Bay Area. These sites have already been graded to develop industrial, institutional, or commercial facilities and are typically surrounded by uses of similar kind. Cultural resources are generally not located within these areas.

## Regulatory Background

The State CEQA Guidelines define a significant cultural resource as a “resource listed or eligible for listing on the California Register of Historical Resources” (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5(b)). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the

physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the California Register of Historical Resources or a local register or survey that meets the requirements of Public Resources Code Sections 50020.1(k) and 5024.1(g).

## **Discussion of Impacts**

**V a – d.** No impacts on cultural resources are anticipated from the proposed rule amendments that would apply to industrial and commercial heaters. The heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial, institutional, or commercial facilities. New heaters are expected to be installed in similar areas, and would be compliant with the amendments of the proposed Regulation 9-7. The existing areas have been graded and developed. No new construction would be required outside of the existing facility boundaries due to the adoption of the proposed amendments to Regulation 9-7. Therefore, no significant adverse impacts to cultural resources are expected due to the proposed amendments to Regulation 9-7.

Based upon these considerations, no significant adverse impacts to cultural resources are expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. GEOLOGY AND SOILS.</b>				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• 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? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Strong seismic groundshaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The facilities affected by the proposed rule amendments are expected to be located primarily in residential and commercial areas throughout the Bay Area.

The affected areas with natural gas-fired heaters are located in the natural region of California known as the Coast Ranges geomorphic province. The province is characterized by a series of northwest trending ridges and valleys controlled by tectonic folding and faulting, examples of which include the Suisun Bay, East Bay Hills, Briones Hills, Vaca Mountains, Napa Valley, and Diablo Ranges.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone inter-fingered with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along “active” faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

## **Regulatory Background**

Construction is regulated by the local City or County building codes that provide requirements for construction, grading, excavations, use of fill, and foundation work including type of materials, design, procedures, etc. which are intended to limit the probability of occurrence and the severity of consequences from geological hazards. Necessary permits, plan checks, and inspections are generally required.

The City or County General Plan includes the Seismic Safety Element. The Element serves primarily to identify seismic hazards and their location in order that they may be taken into account in the planning of future development. The Uniform Building Code is the principle mechanism for protection against and relief from the danger of earthquakes and related events.

In addition, the Seismic Hazard Zone Mapping Act (Public Resources Code §§2690 – 2699.6) was passed by the California legislature in 1990 following the Loma Prieta earthquake. The Act required that the California Division of Mines and Geology (DMG) develop maps that identify the areas of the state that require site specific investigation for earthquake-triggered landslides and/or potential liquefaction prior to permitting most urban developments. The act directs cities, counties and state agencies to use the maps in their land use planning and permitting processes.

Local governments are responsible for implementing the requirements of the Seismic Hazards Mapping Act. The maps and guidelines are tools for local governments to use in establishing their land use management

policies and in developing ordinances and review procedures that will reduce losses from ground failure during future earthquakes.

## Discussion of Impacts

**VI a.** The natural gas-fired heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial, institutional, or commercial facilities. New heaters are expected to be installed in similar areas, and would be compliant with the amendments of the proposed Regulation 9-7. No new construction activities would be required as a result of adopting the proposed amendments to Regulation 9-7, rather, old equipment would be required to be upgraded with newer technology to lower NOx emissions, while new equipment will meet the requirements of Regulation 9-7 upon installation. New industrial, institutional, or commercial structures must be designed to comply with the Uniform Building Code Zone 4 requirements. The local cities and counties are responsible for assuring that new construction complies with the Uniform Building Code as part of the issuance of the building permits 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 goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

New industrial, institutional, or commercial development will install low NOx emitting equipment and will be required to obtain building permits, as applicable, for all new structures at any site. The issuance of building permits from the local agency will assure compliance with the Uniform Building Code requirements which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since no new development is required due to implementation of the proposed amendments to Regulation 9-7.

**VII b.** The natural gas-fired heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial, institutional, or commercial facilities. New heaters are expected to be installed in similar areas, and would be compliant with the amendments of the proposed Regulation 9-7. The specified equipment will be upgraded with low NOx emitting equipment. No new construction activities would be required due to the adoption of Regulation 9-7. Therefore, the proposed amendments are not expected to result in substantial soil erosion or the loss of topsoil as no major construction activities would be required.

**VII c – e.** The natural gas-fired heaters that already exist and are located within the confines of existing industrial, institutional, or commercial facilities so no major construction activities are expected. Since the industrial, institutional, or commercial facilities already exist, no additional structures would be constructed on a geologic unit or soil that is unstable or that would become unstable, or potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse. Likewise, no structure would be constructed on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property. Compliance with the Uniform Building Code would minimize the

impacts associated with existing geological hazards. Construction would not affect soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater. Therefore, no adverse significant impacts to geology and soils are expected due to the proposed amendments to Regulation 9-7.

Based upon these considerations, no significant geology and soils impacts are expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:</b>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Be located within an airport land use plan or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

Many of the affected facilities handle and process large quantities of flammable, hazardous, and acutely hazardous materials. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

The potential hazards associated with handling such materials are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facilities where they exist. 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 the following events.

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. “Worst-case” conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.
- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The “worst-case” upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.
- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.
- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at many types of industrial facilities. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

For all affected facilities, risks to the public are reduced if there is a buffer zone between industrial processes and residences or other sensitive land uses, or the prevailing wind blows away from residential areas and other sensitive land uses. The risks posed by operations at each facility are unique and determined by a variety of factors. The areas affected by the proposed amendments are typically located in industrial and commercial areas.

## Regulatory Background

There are many federal and state rules and regulations that facilities handling hazardous materials must comply with which serve to minimize the potential impacts associated with hazards at these facilities.

Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 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, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program.

Affected facilities that store materials are required to have a Spill Prevention Control and Countermeasures (SPCC) Plan per the requirements of 40 Code of Federal Regulations, Section 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 CFR Subchapter C). The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

Contra Costa County has adopted an industrial safety ordinance that addresses the human factors that lead to accidents. The ordinance requires stationary sources to develop a written human factors program that includes considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

## Discussion of Impacts

**VII a - c.** It is expected that the proposed amendments to Regulation 9-7 will lead to a reduction in NOx emissions from existing heaters at affected facilities thus reducing PM and NOx emissions. About seven facilities could choose to comply by installing SCR technology to reduce NOx emissions. SCRs use ammonia or urea to react with NOx, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Safety hazards related to the transport, storage and handling of ammonia exist. Ammonia is considered to be a hazardous chemical. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM10 emissions under some circumstances. Facilities can use either aqueous ammonia or anhydrous ammonia, but city codes and planning agencies in the Bay Area generally require the use of aqueous ammonia. In addition, District permit conditions can also specify the use of aqueous ammonia.

Most affected facilities are expected to comply with the proposed amendments to Regulation 9-7 by installation of low NO<sub>x</sub> burners and/or FGR. However, a few facilities may comply with add on pollution control units, e.g., SCR. SCR units require ammonia to react with NO<sub>x</sub> emissions in the exhaust gases to reduce the NO<sub>x</sub> emissions. The EIR prepared for the 2005 Ozone Strategy evaluated the potential impacts of ammonia use. The main hazard associated with ammonia is associated with a release that generates a toxic cloud and those hazards are summarized below.

**On-Site Release Scenario:** The use of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric pressure and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and gas is only produced when a liquid pool from a spill evaporates. Under current OES regulations implementing the CalARP requirements, aqueous ammonia is regulated under California Health and Safety Code Section 2770.1.

The proposed amendments may require the increased use and storage of ammonia, primarily in industrial/commercial zones. The use and storage of anhydrous ammonia would be expected to result in potentially significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressures) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present and the distance from the release. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts. However, anhydrous ammonia is unlikely to be allowed by planning agency conditions, city codes or District permit conditions.

In the event of an aqueous ammonia release, 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 release from on-site vessels or storage tanks, spills would be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that would evaporate, form a vapor cloud, and impact residences or other sensitive receptors (including schools) in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected.

In addition, the following safety design and process standards generally apply to facilities that use and store ammonia:

- The California Code of Regulations, Title 8 – contains minimum requirements for equipment design.
- Industry Standards and Practices – codes for design of various equipment, including the American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), and National Fire Protection Association (NFPA).
- The Occupational Safety and Health Administration (OSHA) passed the Process Safety Management of Highly Hazardous Chemicals rule in 1992 (29 CFR 910.119). This rule was designed to address the prevention of catastrophic accidents at facilities handling hazardous substances, in excess of specific threshold amounts, through implementation of Process Safety Management (PSM) systems for protection

of workers. A major PSM requirement is the performance of process hazard analyses to identify potential process deviations and improved safeguards to prevent accidents.

- A federal EPA Risk Management Program (RMP) and more stringent state RMP program have been developed. The RMP's contain hazard assessments of both worst-case and more credible accidental release scenarios, a five year accident history, an accident prevention program, and an emergency response program.

The standards noted above and other applicable design standards govern the design of mechanical equipment such as pressure vessels, tanks, pumps, piping, and compressors. Adherence to codes minimizes the potential for an ammonia release.

**Transportation Release Scenario:** Use and transport of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric temperature and pressure, and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and pressure, and gas is only produced when a liquid pool from a spill evaporates. Deliveries of ammonia would be made to each facility by tanker truck via public roads. The maximum capacity of a tanker truck is about 150 barrels. Regulations for the transport of hazardous materials by public highway are described in 49 CFR 173 and 177. Nineteen percent aqueous ammonia is considered a hazardous material under 49 CFR 172.

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. DOT, there is a possibility that a tanker truck could be involved in an accident spilling its contents. 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.

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

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

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels 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 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. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

In the unlikely event that a tanker truck would rupture and release the entire contents of anhydrous ammonia, the ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressures) and migrate from the point of release. There are federal, State and local agencies with jurisdiction over hazardous materials and waste are responsible for ensuring that hazardous materials and waste handling activities are conducted in accordance with applicable laws and regulations. While compliance with these laws and regulations will minimize the chance of an accidental release of anhydrous ammonia, the potential will still exist that an unplanned release could occur. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

**Conclusion:** Based on the above evaluation and significance criteria, the hazard impacts associated with the use and transport of aqueous ammonia are less than significant. The hazard impacts associated with the use and transport of anhydrous ammonia are potentially significant, but can be mitigated by using aqueous ammonia. Further, the number of facilities expected to use SCR is limited to an estimated seven so no significant increase in the transport of ammonia is expected (about one truck per day). Therefore, the proposed amendments to Rule 9-7 are not expected to generate significant adverse hazard impacts because the increase in ammonia use within the Bay Area is relatively small and limited, and the numerous regulations that exist minimize the potential hazard impacts. Therefore, the impacts of the proposed project on hazards are expected to be less than significant.

**VII d.** No impacts on hazardous material sites are anticipated from the proposed rule amendments that would typically apply to existing industrial, institutional, or commercial operations. Some of the affected areas may be located on the hazardous materials sites list pursuant to Government Code Section 65962.5. However, the proposed rule amendments would have no effect on hazardous materials nor would the amendment create a significant hazard to the public or environment. Natural gas-fired heaters already exist and are located within the confines of industrial, institutional, or commercial facilities. The proposed rule amendments neither require, nor are likely to result in, activities that would affect hazardous materials or existing site contamination. Therefore, no significant adverse impacts on hazards are expected.

**VII e – f.** No impacts on airports or airport land use plans are anticipated from the proposed rule amendments, which would apply to natural gas-fired heaters. The natural gas-fired heaters that already exist are located within the confines industrial or commercial facilities. Once the proposed amendment is implemented, facilities would be expected to comply by replacing or retrofitting process heaters. These changes are expected to be made within the confines of the existing facilities. No development outside of existing facilities is expected to be required by the proposed amendments to Regulation 9-7. Therefore, no significant adverse impacts on an airport land use plan or on a private air strip are expected.

**VII g.** No impacts on emergency response plans are anticipated from the proposed rule amendments that would apply to existing industrial, institutional, or commercial facilities. The natural gas-fired heaters which already exist are located within the confines of existing industrial or commercial facilities. The proposed rule amendments neither require, nor are likely to result in, activities that would impact the emergency response plan, and new industrial, institutional, or commercial development would consider emergency response as part of the City/County General Plans prior to approval. Therefore, no significant adverse impacts on emergency response plans are expected.

**VII h.** No increase in hazards related to wildfires are anticipated from the proposed rule amendments. The natural gas-fired heaters affected by the proposed amendments that already exist are located within the confines of existing industrial or commercial facilities. No increase in exposure to wildfires will occur due to the proposed amendments to Regulation 9-7.

Based upon these considerations, no significant adverse hazards and hazardous materials impacts are expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**VIII. HYDROLOGY AND WATER QUALITY.**

Would the project:

- |    |  |                          |                          |                          |                                     |
|----|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) | Violate any water quality standards or waste discharge requirements?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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 that would not support existing land uses or planned uses for which permits have been granted)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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 onsite or offsite?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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 onsite or offsite?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) | Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f) | Otherwise substantially degrade water quality?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| h) | Place within a 100-year flood hazard area structures that would impede or redirect flood flows?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| j) | Inundation by seiche, tsunami, or mudflow?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and affected environment vary substantially throughout the area and include commercial, industrial, residential, agricultural, and open space uses.

The industrial, institutional, or commercial facilities affected by the proposed rule amendments are located throughout the Bay Area. Affected areas are generally surrounded by other industrial, institutional, or commercial facilities. Reservoirs and drainage streams are located throughout the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The affected areas are located within the San Francisco Bay Area Hydrologic Basin. The primary regional groundwater water-bearing formations include the recent and Pleistocene (up to two million years old) alluvial deposits and the Pleistocene Huichica formation. Salinity within the unconfined alluvium appears to increase with depth to at least 300 feet. Water of the Huichica formation tends to be soft and relatively high in bicarbonate, although usable for domestic and irrigation needs.

## Regulatory Background

The Federal Clean Water Act of 1972 primarily establishes regulations for pollutant discharges into surface waters in order to protect and maintain the quality and integrity of the nation's waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The 1987 amendments to the Clean Water Act enabled the U.S. EPA to regulate, under the National Pollutant Discharge Elimination System (NPDES) program, discharges from industries and large municipal sewer systems. The U.S. EPA set initial permit application requirements in 1990. The State of California, through the State Water Resources Control Board, has authority to issue NPDES permits, which meet U.S. EPA requirements, to specified industries.

The Porter-Cologne Water Quality Act is California's primary water quality control law. It implements the state's responsibilities under the Federal Clean Water Act but also establishes state wastewater discharge requirements. The RWQCB administers the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

In response to the Federal Act, the State Water Resources Control Board prepared two state-wide plans in 1991 and 1995 that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan, which have been updated in 2005 as the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works.

San Francisco Bay, and its constituents parts, including Carquinez Strait and Suisun Bay, fall under this category.

The San Francisco Bay Basin Plan identifies the: (1) beneficial water uses that need to be protected; (2) the water quality objectives needed to protect the designated beneficial water uses; and (3) strategies and time schedules for achieving the water quality objectives. The beneficial uses of the Carquinez Strait that must be protected which include water contact and non-contact recreation, navigation, ocean commercial and sport fishing, wildlife habitat, estuarine habitat, fish spawning and migration, industrial process and service supply, and preservation of rare and endangered species. The Carquinez Strait and Suisun Bay are included on the 1998 California list as impaired water bodies due to the presence of chlordane, copper, DDT, diazinon, dieldrin, dioxin and furan compounds, mercury, nickel, PCBs, and selenium.

## Discussion of Impacts

**VIII a, f.** No significant adverse impacts on hydrology/water quality resources are anticipated from the proposed rule amendments, which would apply primarily to existing industrial, institutional, or commercial facilities. The proposed rule amendments are not expected to require additional water use and no increase in wastewater discharge is expected. Therefore, no violation of any water quality standards or waste discharge requirements, and no decrease in water quality is expected from the proposed amendments to Regulation 9-7.

**VIII b.** The natural gas-fired heaters boilers affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial, institutional, or commercial facilities. As equipment is upgraded, and new equipment installed, low NO<sub>x</sub> emitting units will be in place. The 2005 Ozone Strategy addressed the impacts of control measures on water demand. The proposed amendments to Regulation 9-7 are not expected to require additional water use. The NO<sub>x</sub> control technologies (i.e., low NO<sub>x</sub> burners, FGR, and SCR equipment) does not require additional use of water. Therefore, the proposed amendments are not expected to deplete groundwater supplies or interfere with groundwater recharge. Therefore, no significant impacts on groundwater supplies are expected due to the proposed amendments to Regulation 9-7.

**VIII c - f.** Industrial and commercial facilities are expected to comply with the proposed amendments to Regulation 9-7 by upgrading or installing low NO<sub>x</sub> emitting natural gas-fired heaters. All affected equipment is primarily located in industrial or commercial areas, where storm water drainage has been controlled and no construction activities outside of the existing facilities are expected to be required. Therefore the proposed amendments are not expected to substantially alter the existing drainage or drainage patterns, result in erosion or siltation, alter 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 onsite or offsite. Nor are the proposed amendments expected to create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. The proposed amendments are not expected to substantially degrade water quality. Therefore, no significant adverse impacts to storm water runoff are expected.

**VIII g – i.** The heaters affected by the proposed rule amendments are primarily located within industrial and commercial areas. No major construction activities outside the boundaries of existing facilities are expected due to the adoption of the proposed amendments to Regulation 9-7. Industrial and commercial facilities are generally located to avoid flood zone areas and other areas subject to flooding. The proposed amendments

are not expected to require additional construction activities, place any additional structures within 100-year flood zones, or other areas subject to flooding. Therefore, no significant adverse impacts due to flooding are expected.

**VIII j.** The industrial and commercial facilities affected by the proposed rule amendments are located within industrial and commercial areas. No major construction activities are expected outside of the boundaries of the existing facilities due to the adoption of the proposed amendments to Regulation 9-7. The proposed amendments are not expected to place any additional structures within areas subject to inundation by seiche, tsunami or mudflow. Therefore, no significant adverse impacts on hydrology/water due to seiche, tsunami or mudflow are expected.

Based upon these considerations, no significant adverse hydrology and water quality impacts are expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX. LAND USE AND PLANNING.</b> Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The facilities affected by the proposed rule amendments are primarily located in residential and commercial areas throughout the Bay Area.

## Regulatory Background

Land uses are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

## Discussion of Impacts

**IX a-c.** The natural gas-fired heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial, institutional, or commercial facilities. Industrial, institutional, or commercial facilities are expected to comply with Regulation 9-7 by upgrading or installing low NOx emitting natural gas-fired heaters or NOx control equipment. These changes are expected to be made within the confines of existing facilities as it will generally require modifications to existing heaters or replacement of existing heaters. SCR may be required for compliance at a few facilities but is expected to be constructed within the confines of the existing facilities. No new construction outside of the confines of the existing facilities is expected to be required due to the adoption of the proposed amendments to Regulation 9-7.

Based upon these considerations, no significant adverse impacts to land use are expected due to the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X. MINERAL RESOURCES.</b> 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the proposed rule amendments are primarily located in residential and commercial areas throughout the Bay Area.

## Regulatory Background

Mineral resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

## Discussion of Impacts

**X a-b.** The natural gas-fired heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial and commercial facilities. New heaters and control equipment are expected to be installed in similar areas and within the confines of existing facilities. The proposed rule amendments are not associated with any action that 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, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Therefore, no impacts on mineral resources are expected.

Based upon these considerations, significant mineral resource impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XI. NOISE. Would the project:</b>				
a) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Expose persons to or generate of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Be 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 and expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be located within the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the proposed rule amendments are primarily located in industrial, institutional, or commercial areas throughout the Bay Area. A majority of the affected areas are surrounded by other industrial, institutional, or commercial facilities.

## Regulatory Background

Noise issues related to construction and operation activities are addressed in local General Plan policies and local noise ordinance standards. The General Plan and noise ordinances generally establish allowable noise limits within different land uses including residential areas, other sensitive use areas (e.g., schools, churches, hospitals, and libraries), commercial areas, and industrial areas.

## Discussion of Impacts

**XI a-d.** The natural gas-fired heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial and commercial facilities. The rule amendments impose limitations on the NO<sub>x</sub> emissions from this equipment. Compliance will be achieved by upgrading or installing low NO<sub>x</sub> emitting natural gas-fired heaters.

No new construction activities would be required due to the adoption of the proposed amendments to Regulation 9-7. No noise impacts associated with construction would result from adoption of the proposed rule. No increase in noise is expected due to operation of the low NO<sub>x</sub> emitting equipment. The technologies that are expected to be used to comply with the proposed rule amendment are not expected to result in an increase in noise. Therefore, no adverse significant impacts to noise are expected due to the proposed project.

**XI a-d.** Owners/operators of facilities affected by the proposed rule amendments would be required to replace, retrofit heaters with low NO<sub>x</sub> equipment or install pollution control devices. Modifications or changes associated with the implementation of the proposed amendments will take place at existing facilities that are located in industrial and commercial 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 and SCR unit, 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. Depending on the air pollution control technology installed, replaced, or modified, the operations phase of the proposed project may add new sources of noise to the affected facility. Noise increases associated with SCR units are expected to be limited to small motors for air blowers and or pumps. 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.

**XI. e-f.** Though some of the facilities affected by the proposed project are located at sites within an airport land use plan, or within two miles of a public airport, the addition of new or modification of existing 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 above considerations, significant noise impacts are not expected from the implementation of the proposed project.

Based upon these considerations, significant noise impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. POPULATION AND HOUSING.</b> Would the project:				
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The areas affected by the proposed rule amendments are primarily located in residential and commercial areas throughout the Bay Area.

## Regulatory Background

Population and housing growth and resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

## Discussion of Impacts

**XII. a.** 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 Bay Area. 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. 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 BAAQMD 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.

**XII b-c.** Because the proposed project includes modifications and/or changes at existing facilities located in industrial and commercial 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 Bay Area. Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**XIII. PUBLIC SERVICES.** Would the project:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental 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:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Setting**

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The areas affected by the proposed rule amendments are primarily located in industrial, institutional, or commercial areas throughout the Bay Area.

Given the large area covered by the BAAQMD, public services are provided by a wide variety of local agencies. Fire protection and police protection/law enforcement services within the BAAQMD are provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts.

**Regulatory Background**

City and/or County General Plans usually contain goals and policies to assure adequate public services are maintained within the local jurisdiction.

**Discussion of Impacts**

XIII a. Implementation of the proposed project by installing new or modifying existing add-on controls is anticipated to continue current operations at existing affected facilities. The proposed project 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. The proposed project is not expected to significantly affect fire or police departments because of the low probability of accidents during transport and the limited number of facilities that are expected to use SCR (about seven). Therefore, 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 “Population and Housing” discussion above, 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.

Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIV. RECREATION. Would the project:</b>				
a) 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.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that there are numerous areas for recreational activities. The facilities areas affected by the proposed rule amendments are located in industrial and commercial areas throughout the Bay Area. Public recreational land uses are generally located adjacent to these areas.

## Regulatory Background

Recreational areas are generally protected and regulated by the City and/or County General Plans at the local level through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

## Discussion of Impacts

**XIV a-b.** As discussed under “Land Use” above, there are no provisions of 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 will 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. Therefore, no significant adverse impacts on recreation are expected.

Based upon these considerations, significant recreation impacts are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**XV. TRANSPORTATION/TRAFFIC.** Would the project:

a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards because of a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Setting**

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles). Transportation systems located within the Bay Area include railroads, airports, waterways, and highways. The Port of Oakland and three international airports in the area serve as hubs for commerce and transportation. The transportation infrastructure for vehicles and trucks in the Bay Area ranges from single lane roadways to multilane interstate highways. The Bay Area contains over 19,600 miles of local streets and roads, and over 1,400 miles of state highways. In addition, there are over 9,040 transit route miles of services including rapid rail, light rail, commuter, diesel and electric buses, cable cars, and ferries. The Bay Area also has an extensive local system of bicycle routes and pedestrian paths and sidewalks. At a regional level, the share of workers driving alone was about 68 percent in 2000. The portion of commuters that carpool was about 12.9 percent in 2000. About 3.2 percent of commuters walked to work

in 2000. In addition, other modes of travel (bicycle, motorcycle, etc.), account for 2.2 percent of commuters in 2000 (MTC, 2004). Cars, buses, and commercial vehicles travel about 143 million miles a day (2000) on the Bay Area Freeways and local roads. Transit serves about 1.7 million riders on the average weekday (MTC, 2004).

The region is served by numerous interstate and U.S. freeways. On the west side of San Francisco Bay, Interstate 280 and U.S. 101 run north-south. U.S. 101 continues north of San Francisco into Marin County. Interstates 880 and 660 run north-south on the east side of the Bay. Interstate 80 starts in San Francisco, crosses the Bay Bridge, and runs northeast toward Sacramento. Interstate 80 is a six-lane north-south freeway which connects Contra Costa County to Solano County via the Carquinez Bridge. State Routes 29 and 84, both highways that allow at-grade crossings in certain parts of the region, become freeways that run east-west, and cross the Bay. Interstate 580 starts in San Rafael, crosses the Richmond-San Rafael Bridge, joins with Interstate 80, runs through Oakland, and then runs eastward toward Livermore. From the Benicia-Martinez Bridge, Interstate 680 extends north to Interstate 80 in Cordelia. Caltrans constructed a second freeway bridge adjacent and east of the existing Benicia-Martinez Bridge. The new bridge consists of five northbound traffic lanes. The existing bridge was re-striped to accommodate four lanes for southbound traffic. Interstate 780 is a four lane, east-west freeway extending from the Benicia-Martinez Bridge west to I-80 in Vallejo.

## Regulatory Background

Transportation planning is usually conducted at the state and county level. Planning for interstate highways is generally done by the California Department of Transportation.

Most local counties maintain a transportation agency that has the duties of transportation planning and administration of improvement projects within the county and implements the Transportation Improvement and Growth Management Program, and the congestion management plans (CMPs). The CMP identifies a system of state highways and regionally significant principal arterials and specifies level of service standards for those roadways.

## Discussion of Impacts

**XV a-b.** Construction activities resulting from implementing the proposed amendments to Regulation 9-7 may generate a slight, although temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, the proposed project is not expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities. Also, the proposed project is not expected to exceed, either individually or cumulatively, the current 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 the proposed project and operation-related traffic is expected to be minimal. Thus, the traffic impacts associated with the proposed rule amendments are expected to be less than significant.

**XV c.** Though some of the facilities that will be affected by the proposed project may be 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 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, the proposed project 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.

**XV d - e.** The siting of each affected facility is expected to be 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 installation or modification of air pollution control equipment, 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 their existing emergency access gates and will not be impacted by the proposed rule amendments.

**XV 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 the proposed project. Therefore, the proposed rule amendments will not result in significant adverse impacts on parking.

**XV g.** 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 rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
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**XVI. UTILITIES AND SERVICE SYSTEMS.**

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Setting**

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area.

Given the large area covered by the BAAQMD, public utilities are provided by a wide variety of local agencies. The most affected facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of NPDES permits.

Water is supplied to affected facilities by several water purveyors in the Bay Area. Solid waste is handled through a variety of municipalities, through recycling activities and at disposal sites.

There are no hazardous waste disposal sites within the jurisdiction of the BAAQMD. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

## Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate utilities and service systems are maintain within the local jurisdiction.

## Discussion of Impacts

**XVI a, b, d and e.** The natural gas-fired heaters affected by the proposed rule amendments already exist and are primarily located within the confines of existing industrial, institutional, or commercial facilities. New heaters are expected to be installed in similar areas, and would be compliant with the amendments of the proposed Regulation 9-7. The proposed rule amendments are not expected to generate additional wastewater generated by the affected industrial, institutional, or commercial facilities. Additionally, no increase in water consumption would be associated with NO<sub>x</sub> control equipment. Therefore, no impacts on wastewater treatment requirements or wastewater treatment facilities is expected.

**XVI c.** Industrial, institutional, or commercial facilities are expected to comply by installing NO<sub>x</sub> control equipment. Construction activities would involve replacing existing heaters or installing air pollution control equipment within the confines of existing facilities. Therefore, the proposed amendments are not expected to alter the existing drainage or require the construction of new storm water drainage facilities. Nor are the proposed amendments expected to create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no significant adverse impacts on storm drainage facilities are expected.

**XVI f and g.** The proposed rule amendments would not affected the ability of industrial and commercial facilities to comply with federal, state, and local statutes and regulations related to solid waste. No significant impacts on waste generation are expected from the proposed rule amendments, since the proposed amendments would retrofit or replace equipment over a number of years. Waste is expected to be limited to metal, in the event that old equipment is replaced with new equipment. Metals are usually recycled so no significant impact to land disposal facilities would be expected.

The proposed project modifications may generate hazardous waste from spent catalyst in the SCR unit. The catalyst has a life expectancy ranging from about five to ten years, depending on the catalyst reaction rate. Spent catalysts are expected to be recycled offsite for their heavy metal content. Therefore, no significant impacts to hazardous waste disposal facilities are expected due to the proposed rule amendments. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

Based upon these considerations, significant impacts to utilities and service systems are not expected from the implementation of the proposed rule amendments.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVII. MANDATORY FINDINGS OF SIGNIFICANCE.</b>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Discussion of Impacts

**XVII a.** The proposed rule amendments do not 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, as discussed in the previous sections of the CEQA checklist. The proposed rule amendments are expected to result in emission reductions from industrial and commercial facilities with heaters, thus providing a beneficial air quality impact and improvement in air quality. As discussed in Section IV, Biological Resources and Section V, Cultural Resources, no significant adverse impacts are expected to biological or cultural resources.

**XVII b-c.** The proposed amendments are expected to result in emission reductions of NOx from affected industrial and commercial facilities with heaters, thus providing a beneficial air quality impact and improvement in air quality. The proposed rule amendments are part of a long-term plan to bring the Bay Area into compliance with the state ambient air quality standards for ozone, thus reducing the potential health impacts due to ozone exposure. The proposed rule amendments do not have adverse environmental impacts that are limited individually, but cumulatively considerable when considered in conjunction with other regulatory control projects. The proposed rule amendments are not expected to have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly. No significant adverse environmental impacts are expected.

**Chapter 4****References**

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