

**Draft Environmental Impact Report for the  
Bay Area Air Quality Management District**

**Regulation 12-15: Petroleum Refining Emissions Tracking  
Regulation 12-16: Petroleum Refining Emissions Limits and Risk  
Thresholds**

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**REGULATION 12-15: PETROLEUM REFINERY EMISSIONS TRACKING  
REGULATION 12-16: PETROLEUM REFINING EMISSIONS LIMITS AND RISK  
THRESHOLDS**

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# **CHAPTER 1**

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## **INTRODUCTION**

### Introduction

California Environmental Quality Act

Notice of Preparation and Initial Study

Type of EIR

Intended Uses of this Document

Areas of Controversy

Project Objectives

Document Format

Executive Summary of Draft EIR

Executive Summary – Chapter 2: Project Description

Executive Summary – Chapter 3: Environmental Setting,  
Impacts, Mitigation Measures and  
Cumulative Impacts

Executive Summary – Chapter 4: Alternatives Analysis

Executive Summary – Chapter 5: References



## **1.1 INTRODUCTION**

The Bay Area Air Quality Management District (BAAQMD or District) was established in 1955 by the California Legislature to control air pollution in the counties around San Francisco Bay and to attain federal air quality standards by the dates specified in federal law. There have been significant improvements in air quality in the Bay Area over the last several decades. The BAAQMD is also required to meet state standards by the earliest date achievable.

Refineries are among the largest single sources of criteria pollutants and greenhouse gas (GHG) emissions in the Bay Area. Additionally, the five Bay Area refineries rank among the top ten facilities in the District for risk-weighted emissions of toxic air contaminants (TAC). Bay Area refineries are also some of the largest individual sources of NO<sub>x</sub> and SO<sub>2</sub> in the region. Refineries are extremely large and complex facilities comprising many plants (or process units) that function to refine crude oil into various products such as gasoline, diesel fuel, jet fuel, and asphalt. While historically, refinery emissions have tended to decrease overall over time; there are occasions when some emissions have increased despite the regulatory environment under which they operate. Some of the factors that can result in increased refinery emissions include higher production rates to meet increased demand or compensate for loss of production in other regions, upset conditions and accidents, and changes in crude oil or product slates.

This EIR addresses the impacts due to implementation of the Bay Area Air Quality Management District (“the District” or BAAQMD) Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (“Tracking Rule”); and Regulation 12, Rule 16: Petroleum Refining Emissions and Risks Limits (“Emission Risk Limits Rule”). The development of these rules was included as Action Item 4 in the Air District’s Work Plan for Action Items Related to Accidental Releases from Industrial Facilities, which was approved by the Air District’s Board of Directors on October 17, 2012.

### **1.1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT**

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified.

To fulfill the purpose and intent of CEQA, the BAAQMD has prepared this Environmental Impact Report (EIR) under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the proposed Regulation 12, Rules 15 and 16. Prior to making a decision on the adoption of the proposed new tracking and emission limits rules, the BAAQMD Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed new Rules.



### **1.1.2 NOTICE OF PREPARATION AND INITIAL STUDY**

A Notice of Preparation and Initial Study (NOP/IS) for the adoption of District Regulation 12, Rules 15 and 16 (included as Appendix A of this EIR) was distributed to responsible agencies and interested parties for a 30-day review on February 23, 2015. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the BAAQMD's web site, and was also published in newspapers throughout the area of the BAAQMD's jurisdiction. The Air District received one comment letter suggesting the EIR should also address aesthetics, geology and soils, land use and planning, and consider an alternative to evaluate the potential shutdown of a refinery. These issues are addressed in response to comments included in Appendix A.

The NOP/IS identified the following environmental resources as being potentially significant, requiring further analysis in the EIR: air quality, greenhouse gases, hazards and hazardous materials, and hydrology and water quality. The following environmental resources were considered to be less than significant in the NOP/IS: aesthetics, agriculture and forestry resources, biological resources, cultural resources, geology/soils, land use/planning, mineral resources, noise, population/ housing, public services, recreation, transportation/ traffic, and utilities/service systems (see Appendix A).

### **1.1.3 TYPE OF EIR**

In accordance with §15121(a) of the State CEQA Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an EIR is to serve as an informational document that: "will inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project."

The EIR is an informational document for use by decision-makers, public agencies and the general public. The proposed project requires discretionary approval and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

The focus of this EIR is to address the environmental impacts of the implementation of Regulation 12-15 and 12-16 as identified in the NOP and Initial Study (included as Appendix A of this EIR). The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Regulation 12-16 would establish lower toxic risk levels for refineries; establish maximum refinery-wide emissions limits for sulfur dioxide (SO<sub>2</sub>) and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>) and require refinery operators to demonstrate that their facilities will not cause an exceedance of the National Ambient Air Quality Standards (NAAQS) for SO<sub>2</sub> and PM<sub>2.5</sub>. If impacts exceed acceptable levels, additional emission reductions for SO<sub>2</sub>, PM<sub>2.5</sub> and TAC emissions would be required. Since the need for emission reductions has not yet been determined, the actual control measures that will be required to reduce emissions, if any, is unknown. Therefore, the EIR evaluates the impacts of potential emissions control measures that could be utilized.

### **1.1.4 INTENDED USES OF THIS DOCUMENT**

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

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

1. A list of the agencies that are expected to use the EIR in their decision-making;
2. A list of permits and other approvals required to implement the project; and
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

Other local public agencies, such as cities, county planning commissions, etc., may use the EIR for the purpose of evaluating emission reduction projects, if local approvals are required, e.g., use permits or building permits.

### **1.1.5 AREAS OF CONTROVERSY**

In accordance to CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. One comment on the Initial Study suggested that the EIR should also address aesthetics, geology and soils, land use and planning, and consider an alternative to evaluate the potential shutdown of a refinery. Other stakeholders have advocated for more stringent limits on refinery emissions, essentially limiting the refinery to current emission levels for key criteria pollutants and climate pollutants. The refinery operators have challenged the assertion that changes in crude oil are associated with increases in emissions and question the necessity for the regulations.

### **1.1.6 PROJECT OBJECTIVES**

CEQA Guidelines §15124(b) requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers

in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed Regulation 12, Rules 15 and 16 are summarized below.

- Accurately and consistently characterize emissions of all pollutants (criteria, toxic, and greenhouse gases) from refinery-related emissions sources in an on-going basis to determine if there is room for improvement;
- Determine if significant changes to the crude slate (such as the refining of heavier and/or more sour crude oil) result in increased emissions of air pollutants.
- Ensure refineries comply with the ambient air quality standards for SO<sub>2</sub> and PM<sub>2.5</sub>;
- Determine the energy efficiency of the refineries;
- Determine the level of toxic exposure and risk refineries pose to the residents of nearby communities;
- Ensure refinery toxic emissions do not pose an unacceptable health risk to the residents of their nearby communities; and
- Provide information to the public on refinery emissions, any significant crude slate changes, and health risk impacts.

### **1.1.7 DOCUMENT FORMAT**

State CEQA Guidelines outline the information required in an EIR, but allow the format of the document to vary [CEQA Guidelines §15120(a)]. The information in the EIR complies with CEQA Guidelines §15122 through §15131 and consists of the following:

Chapter 1: Introduction

Chapter 2: Project Description

Chapter 3: Environmental Setting, Impacts and Mitigation Measures

Chapter 4: Alternatives Analysis

Chapter 5: References

Appendix A: Notice of Preparation/Initial Study

## **1.2 EXECUTIVE SUMMARY OF DRAFT EIR**

### **1.2.1 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION**

#### **1.2.1.1 Introduction**

The BAAQMD is proposing two new rules that would apply to petroleum refineries located in the San Francisco Bay Area. Regulation 12-15 is being proposed to establish requirements to enhance the tracking of refinery emissions and crude oil composition over time, as well as increase air monitoring activities at refinery fence lines and in the nearby community. Regulation 12-16 would utilize the AB 2588 Air Toxic “Hot Spots” Program to establish lower toxic risk levels for refineries. The rule would establish maximum refinery-wide emissions limits for SO<sub>2</sub> and PM<sub>2.5</sub> at each Bay Area refinery and specific support facilities based on the potential to emit levels for all sources. The rule also would require refinery operators to develop an emission reduction plan for District review and approval that would detail the measures that would be implemented and a schedule of implementation to comply with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub> if the refinery operators could not demonstrate compliance with these standards.

#### **1.2.1.2 Project Location**

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District 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. Proposed Regulations 12-15 and 12-16 would affect five refineries and five refinery-related facilities including two sulfuric acid plants, two hydrogen plants, and one coke calcining plant within the Bay Area.

#### **1.2.1.3 Project Description**

The proposed regulatory approach for Regulation 12-15 would require refinery operators to report on-going annual emissions inventories of all regulated air pollutants, report on-going crude oil and other raw material characteristics, report energy audit results to the District, develop a Petroleum Emissions Profile (PREP) based on three years of emissions inventory, require updated refinery Health Risk Assessments (HRAs), and establish fence-line and community air monitoring systems.

The proposed regulatory approach for Regulations 12-16 would establish maximum emissions limits for SO<sub>2</sub> and PM<sub>2.5</sub> from all permitted sources at each Bay Area refinery and specific support facilities, require refinery operators to demonstrate that their facilities will not cause an exceedance of the NAAQS for SO<sub>2</sub> or PM<sub>2.5</sub> when operating at their maximum allowed emission rate. If compliance with the NAAQS cannot be demonstrated through modeling or monitoring, the refinery operators would be required to prepare and implement an Emissions Reduction Plan.

Under Regulation 12-15, refinery operators must submit a new HRA to the District as defined in Section 12-15-405. If the refinery-wide HRA results exceed the notification level, the refinery operators must notify potentially exposed people at or above those levels of the results of the HRA. If the refinery-wide HRA results exceed the significance level (either the cancer risk level of 25 in a million or the acute or chronic risk of 2.5 in a million), the refinery operator must notify potentially exposed people of the results of the HRA, and conduct a toxic risk reduction audit and develop a plan that would reduce health risk below the significant level within three to five years. If, following implementation of the risk reduction plan, the residual refinery-wide health risk remains in excess of the significant level, or if the risk level exceeds the significant level for other reasons (increased throughput or changing crude or product slates), additional risk reduction measures may be required to ensure the risk level decreases and remains below the significant level.

#### **1.2.1.4 Refinery Units That May Be Affected by the Proposed Project**

If compliance with the NAAQS cannot be demonstrated through modeling or monitoring or the updated HRA shows TAC emissions exceed the significant risk thresholds, then the refinery operator's must submit to the Air District an Emission Reduction Plan or Risk Reduction Plan that identifies measures to reduce SO<sub>2</sub> or PM<sub>2.5</sub> emissions or cancer or non-cancer health risks, respectively. The most likely means of reducing SO<sub>2</sub> or PM<sub>2.5</sub> emissions or risk would be to further control emissions sources of these regulated pollutants at the refinery. The typical types of refinery equipment that emit SO<sub>2</sub>, PM<sub>2.5</sub>, TACs and that would most likely be subject to further control, include boilers and heaters, Diesel Internal Combustion Engines, Fluid Catalytic Cracking Units, Petroleum Coke Calciners, and Sulfur Recovery Units/Tail Gas Units.

#### **1.2.1.5 Applicable SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC Control Technologies**

If an affected refinery's SO<sub>2</sub> or PM<sub>2.5</sub> emissions exceed the refinery-wide emission limits in Regulation 12-16 or updating an affected refinery's HRA requires implementing risk reduction measures, the refinery operators must undertake emission or risk reduction strategies, such as reducing throughput, or installing air pollution control equipment. SO<sub>x</sub> and particulate control technologies include Wet Gas Scrubbers, SO<sub>x</sub> Reducing Additives, Fuel Gas Treatment, Baghouses, Cyclones, Electrostatic Precipitators, Diesel Particulate Filters, and Diesel Oxidation Catalysts.

**1.2.2 EXECUTIVE SUMMARY – CHAPTER 3: ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS**

**1.2.2.1 Air Quality**

1.2.2.1.1 Environmental Setting

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, volatile organic compounds (VOC), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), PM<sub>10</sub> and PM<sub>2.5</sub>. These standards were established to protect sensitive individuals with a margin of safety from adverse health impacts due to exposure to air pollution.

The 2014 air quality data from the BAAQMD monitoring stations shows pollutant levels 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 on five days in the District in 2014, while the state 8-hour standard was exceeded on ten days. The State 1-hour ozone standard was exceeded on three days in 2014 in the District. The ozone standards are most frequently exceeded in the Eastern District (Livermore (7 days) and San Ramon (4 days)), and the Santa Clara Valley (Gilroy (4 days), and Los Gatos (3 days)). The District is in attainment of the State and federal ambient air quality standards for CO, NO<sub>x</sub>, and SO<sub>2</sub>. The District is not considered to be in attainment with the ozone standards and State PM<sub>10</sub> and PM<sub>2.5</sub> standards.

Non-Criteria Pollutants

Although the primary mandate of the BAAQMD is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the BAAQMD jurisdiction, the BAAQMD also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. TACs can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute affects such as eye watering, respiratory irritation, running nose, throat pain, and headaches. TACs are separated into carcinogens and non-carcinogens based on the nature of the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Non-carcinogenic

substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is expected to occur.

#### 1.2.2.1.2 Environmental Impacts

Regulation 12-15 includes establishing requirements to enhance tracking of refinery emissions and crude composition, as well as requiring updating HRAs. CEQA recognizes that regulatory requirements consisting of data collection or information gathering do not typically generate environmental impacts. Regulation 12-15 has been thoroughly evaluated and it has been concluded that, with one exception as explained in Subsection 3.2.3.1, it has no potential to generate any other potentially significant adverse environmental impacts and, therefore, will not be evaluated further in the remaining environmental impact discussions.

Regulation 12-16 would use emissions inventory data gathered under Regulation 12-15 to establish refinery-wide emissions limits for SO<sub>2</sub> and PM<sub>2.5</sub> and require refinery operators to demonstrate compliance with the NAAQS at those levels. (Regional monitoring for NAAQS compliance may not be fully capturing local impacts from refinery operations.) If refinery operators cannot demonstrate compliance with the NAAQS, they would be required reduce emissions. Similarly, if an updated HRA shows that refinery-wide cancer or non-cancer health risks exceed any of the proposed significant risk levels (action levels), risk reduction measures would be required. Some control technologies have the potential to reduce some or all pollutants regulated pursuant to Regulation 12-16. The analysis of potential secondary adverse environmental impacts from control equipment identified in Chapter 2 that may be installed as a result of implementing Regulation 12-16 have been further analyzed in Chapter 3.

Construction activities associated with installing air pollution control technologies would result in VOC, NO<sub>x</sub>, SO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and GHG emissions. A range of construction scenarios for installing various types of control equipment were identified in order to determine whether or not construction air quality impacts would exceed any applicable air quality significance thresholds. Construction and installation of some types of air pollution control technologies would not necessarily be expected to result in significant adverse construction air quality impacts. Installation of two or more relatively small air pollution control technologies concurrently could generate significant adverse construction air quality impacts. Similarly, demolition and construction air quality impacts from installing a large-scale air pollution control unit, a single WGS for example, would likely exceed the applicable construction air quality significance thresholds. Therefore, construction air quality impacts from the proposed project are concluded to be significant and mitigation measures are required.

The net effect of implementing the proposed project, Regulation 12-16 in particular, is expected to be reductions in SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions. However, some control technologies have the potential to generate secondary or indirect air quality impacts as part of the control process. The analysis of potential operational air quality impacts from air pollution control equipment indicates that no significant adverse air quality impacts

are associated with the proposed project from baghouses, compressors, cyclones, diesel oxidation catalysts, diesel particulate filters, wet and dry electrostatic precipitators, fuel gas treatment, selective oxidation catalysts, SO<sub>x</sub> reducing additives, new diesel internal combustion engines or wet gas scrubbers. Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions from affected refineries if required pursuant to Regulation 12-16, direct or indirect operational air quality impacts from the proposed project are not expected to exceed the applicable operational air quality significance thresholds. Therefore, mitigation measures to reduce operational air quality impacts are not required.

1.2.2.1.3 Mitigation Measures

The following construction mitigation measures are required to minimize potential significant impacts:

- A-1 Develop a Construction Emission Management Plan for the proposed project.
- A-2 The Emission Management Plan shall include measures to minimize emissions from vehicles.
- A-3 Prohibit construction equipment from idling longer than five minutes.
- A-4 Maintain construction equipment that optimize emissions without nullifying engine warranties.
- A-5 Electric welders shall be used in all construction areas that are demonstrated to be served by electricity.
- A-6 Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.
- A-7 If cranes are required for construction, the refinery operator shall use cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines.
- A-8 For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the refinery operator shall use equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines.
- A-9 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts.

In spite of implementing the construction air quality mitigation measures above, it is likely that installing large-scale air pollution equipment, such as a WGS, or installing of two or more types of air pollution control equipment concurrently, it is likely that construction air quality impacts would continue to exceed any applicable construction air quality significance thresholds and, therefore, remain significant.



#### 1.2.2.1.4 Cumulative Air Quality Impacts

In the analysis of construction air quality impacts it was concluded that air quality impacts from construction activities would be significant from implementing the proposed project because it is likely that installing one large or two or more moderately-sized pieces of air pollution control equipment would exceed significance thresholds. Further, it was concluded that, even after implementing mitigation measures, construction air quality impacts would remain significant. Thus, air quality impacts due to construction activities are considered to be cumulatively considerable pursuant to CEQA Guidelines.

Based on the evaluation of air pollution control technologies that would most likely be the used to reduce SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions from affected refineries if required pursuant to Regulation 12-16, direct or indirect operational air quality impacts from the proposed project were concluded to be minor and less than significant and, therefore are not expected to generate significant adverse cumulative operational impacts.

Because operational TAC emissions do not exceed the applicable cancer and non-cancer health risk significance thresholds, they are not considered to be cumulatively considerable and, therefore are not expected to generate significant adverse cumulative cancer and non-cancer health risk impacts.

### 1.2.2.2 Greenhouse Gas Emissions

#### 1.2.2.2.1 Environmental Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs identified by the Kyoto Protocol are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

In September 2006, the Global Warming Solutions Act of 2006 (AB32) was signed into law requiring CARB to establish a GHG emissions cap for 2020, adopt mandatory reporting rules and an emissions reduction plan, and adopt regulation the achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011. In October 2011, CARB approved the cap-and-trade regulation setting a statewide limit on the emissions from sources responsible for 80 percent of California's greenhouse gas emissions.

#### 1.2.2.2.2 Environmental Impacts

GHG emission impacts contributing to global climate change are considered a cumulative impact analysis rather than a project-specific analysis. GHGs could be emitted during construction activities to install air pollution control equipment from sources such as off-road construction equipment, which could be comprised of off-road mobile sources, e.g., bull dozers, cranes, forklifts, etc., and stationary sources such as generators used for welding or to generate electricity. GHGs could also be emitted during construction from on-road mobile sources such as haul trucks and construction worker commute trips. During operation GHG emission impacts could occur from air pollution control equipment that uses combustion as part of the control process.

Since GHG impacts are based on total cumulative emission, typically over a single year timeframe, construction GHG from installing air pollution control technologies at all affected refineries would contribute to overall GHG emissions impacts. Therefore, based on the above information, construction GHG emissions impacts from the proposed project are concluded to be significant and mitigation measures are required.

Installation of a WGS increases the pressure drop in the flue gas system. Additional power may be needed to compensate for this additional pressure drop. Based on information from Balco Engineering, it is estimated that a new wet gas scrubber would use approximately 3,000 MWhr per year of electricity. The production of electricity to operate the WGSs would generate GHG emissions. The estimated increase in GHG emissions associated with one WGS would be about 876 MT of CO<sub>2</sub>e and the estimated increase associated with three WGS would be approximately 2,628. Since the GHG threshold for air quality plans, rules and regulations is zero, the GHG emissions would be considered potentially significant.

CARB has designed a California Cap-and-Trade program that is enforceable and meets the requirements of AB 32. The program began on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions inventory. The refineries are subject to the requirements of the AB32 Cap-and-Trade Program and have a GHG allocation based on current GHG emissions levels. Should WGSs be installed, GHG offsets would be required. As such, the GHG emissions associated with the WGSs would be required to be offset, so that there would be no net increase in GHG emissions from the refineries. Thus, the GHG operational emissions due to implementation of Rule 12-15 and 12-16 are considered less than significant.

Indirect GHG emission impacts could occur from haul trucks associated with delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis. It was assumed in the air quality analysis that up to 50 additional delivery truck trips per year for each WGS constructed would be necessary. GHG emissions from transporting caustic to affected refineries that install a WGS would not likely exceed the GHG significance threshold and, as a result, operational GHG emission impacts are concluded to be less than significant.

### 1.2.2.2.3 Mitigation Measures

To the extent that construction mitigation identified in the Air Quality section for criteria and precursor pollutant reduce combustion emissions, they will also serve to reduce GHG emissions. Therefore, the construction mitigation measures identified in the Air Quality section above are included herein as mitigation measures to reduce GHG emissions impacts. In addition to the construction mitigation measures identified in the Air Quality section, the following mitigation measures are also required.

- GHG-1 Incorporate best management practices specifically to reduce GHG emissions during construction, as applicable.
- GHG-2 Use alternative fueled (e.g., biodiesel, electric) construction vehicles or equipment of at least 15 percent of the fleet.
- GHG-3 Use local building materials of at least 10 percent.
- GHG-4 Recycle or reuse at least 50 percent of construction waste or demolition materials.
- GHG-5 When air pollution control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the control equipment.

It is likely that installing large-scale air pollution equipment, such as a WGS, or installation two or more types of air pollution control equipment over the course of a year, that GHG emission impacts would continue to exceed the GHG significance threshold identified in the District's California Environmental Quality Act Air Quality Guidelines (BAAQMD, 2011) and, therefore, remain significant.

### **1.2.2.3 Hazards and Hazardous Materials**

#### **1.2.2.3.1 Environmental Setting**

Some of the pollution control equipment which may be installed to comply with an ERP may have direct or indirect hazards associated with their implementation. Hazard concerns are related to the potential for fires, explosions or the release of hazardous substances in the event of an accident or upset conditions. The potential hazards associated with petroleum refining activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the refinery. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including toxic gas clouds, torch fires, thermal radiation, and explosion/overpressure.

#### **1.2.2.3.2 Environmental Impacts**

Because refineries handle a number of hazardous materials, potential hazards and hazardous materials impacts already exist; are generally common to most oil processing

facilities worldwide; and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection, and mitigation systems. The major types of public safety risks at a refinery consist of risks from accidental releases of regulated substances and from major fires and explosions.

Air pollution control technologies that have the potential to generate hazard or hazardous materials impacts include baghouses, compressors, wet and dry electrostatic precipitators (ESPs), fuel gas treatments, catalysts, additives, new diesel ICEs, and wet gas scrubbers. Installation of most types of air pollution control equipment is not expected to cause or contribute to significant adverse hazard impacts, with exception of baghouses or dry ESPs.

### Baghouses

With respect to baghouses, dust has a very large surface area and can be flammable. Explosions are another operating hazard. For an explosion to occur, the concentration of dust in the baghouse housing or duct must be between the lower and upper explosive concentrations and a spark must be present. A potential for an explosion occurs when mechanical cleaning collectors are agitated. At least 281 combustible dust fires and explosions from baghouses occurred in general industries between 1980 and 2005 in the United States, which caused at least 119 fatalities and 718 injuries (Dalsanto, 2011). Therefore, in light of the fact that there is a potential for explosion or fire hazards, to be conservative it is concluded here that baghouses may cause or contribute to significant adverse hazard and hazardous materials impacts.

### Dry ESPs

Hazards associated with dry ESPs include fire and explosion hazards that can occur at the inlet to ESPs when highly charged dust particles are transported by a gas carrier that can contain the mixtures of both incombustible and combustible flue gases. The risk of ignition and even explosion is especially high in the presence of an explosive mixture of oxygen, hydrocarbons, carbon monoxide, etc. The ignition source is typically caused by the breakdown between the corona electrode and the collecting electrode, but in some cases electrostatic discharge (typically back corona,) can also act as an ignition source. Minimum clearance between electrodes may result in repeated “sparkover” causing local heating and vaporization of wires causing the wires to break. Broken wires may swing freely and cause shorting between discharge and collector electrodes. Excessive rapping may also break wires. Poor electrical alignment may cause the wire frame to oscillate fatiguing wires and increasing sparking. If high levels of carbon are known to exist on the collecting surface or in the hoppers, opening the precipitator access doors may result in spontaneous combustion of the hot dust caused by the inrush of air.

In light of the fact that there is a potential for explosion or fire hazards, to be conservative it is concluded here that dry ESPs may cause or contribute to significant adverse hazard and hazardous materials impacts. As a result, feasible mitigation measures pursuant to

CEQA Guidelines §15126.4 have been identified and are applicable to the proposed project.

1.2.2.3.3 Mitigation Measures

To reduce potential fire or explosion impacts from baghouses, the following mitigation measures are required.

- HHM-1 Maintain a comprehensive dust control program, with hazard dust inspections, testing, housekeeping, and control initiatives.
- HHM-2 Ground the filter elements using grounding wires, rods, etc., to prevent sparks that could be generated during cleaning.
- HHM-3 Install additional explosion rupture panels and vent outdoors
- HHM-4 If the collector filters are to be replaced the first procedure is to remove as much flammable or explosive dusts from the filters as possible. Reverse the exhaust fan's direction to maintain a low flow and prevent dust from returning to the hood. Clean the collector one section at a time allowing time for the dust to settle into the collection hopper. After several complete cleaning cycles a large portion of the dust will be ejected, which is expected to lower the exposure of the worker in handling the filter elements.
- HHM-5 Perform all hot work (welding, acetylene cutting, grinding, etc.) away from the collector, if possible.
- HHM-6 Ensure that power tools and impact hand tools (such as hammers, chippers, etc.) used by maintenance personnel that could present a sparking hazard are not used in high dust concentrations. When such work is being performed on the structure itself, make certain the dust concentrations within the enclosure are well below combustible levels.
- HHM-7 Ensure adherence to National Fire Protection Agency (NFPA) standards including, but not limited to, NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (classified) Locations for Electrical Installations in Chemical Process Areas

Implementing the above mitigation measures is expected to ensure that hazard and hazardous materials impacts would not exceed any applicable hazards and hazardous materials significance thresholds, therefore, hazards and hazardous materials impacts from baghouses are concluded to be less than significant.

To ensure that potential fire and explosion risks are less than significant, the following safety mitigation measures have been identified for Dry ESPs:

- HHM-8 Fire and explosion risks can be reduced by equipping dry ESPs with CO sensors that send a signal to a safety system to stop the process when CO concentrations exceed the critical limit. This solution reduces the risk dramatically.
- HHM-9 Modern digital electronic controls shall be used to automate this process to assure the dry ESP operates at peak performance levels at all times.
- HHM-10 The bottom and top of each wire should be covered with shrouds to help minimize sparking and metal erosion at these points.
- HHM-11 To further reduce fire and explosion hazards, affected refinery operators shall establish the inspection frequency of all dry ESP components through a formal in-house maintenance procedure. Vendors' recommendations for an inspection schedule shall be followed and shall include at a minimum, the following procedures.

Daily: On a daily basis operation of hoppers and ash removal system should be checked; the control room ventilation system should be examined; any abnormal arcing in the ESP enclosure and ducts (typically caused by broken wires, which may swing freely causing shorting between discharge and collector electrodes) should be investigated; and electrodes should be checked.

Weekly: Air filters should be checked and cleaned on a weekly or more frequently.

Semi-annually: On a semiannual basis the operator should check the exterior for visual signs of deterioration, and abnormal vibration, noise, or leaks.

Implementing the above mitigation measures is expected to ensure that hazard and hazardous materials impacts would not exceed any applicable hazards and hazardous materials significance thresholds, therefore, hazards and hazardous materials impacts from dry ESPs are concluded to be less than significant.

#### 1.2.2.3.4 Cumulative Impacts

Installation of most types of air pollution control equipment is not expected to cause or contribute to significant adverse hazard impacts, with the exception of baghouses or dry ESPs. Implementing the mitigation measures identified above is expected to reduce significant adverse hazards and hazardous materials impacts to less than the applicable hazards and hazardous materials significance thresholds. Because hazards and hazardous materials impacts do not exceed the applicable hazards and hazardous materials significance thresholds, they are not considered to be cumulatively considerable and, therefore are not expected to generate significant adverse cumulative hazards and hazardous materials impacts.

#### **1.2.2.4 Hydrology and Water Quality**

##### **1.2.2.4.1 Environmental Setting**

The San Francisco Bay Delta system is comprised of the convergence of the Sacramento and San Joaquin Rivers which receive runoff from approximately 40 percent of the land in California (60,000 square miles) and 47 percent of the State's total stream flow through the Carquinez Strait and San Pablo Bay.

Surface waters in the Bay Area include freshwater rivers and streams, coastal waters, and estuarine waters. Estuarine waters include the San Francisco Bay Delta from the Golden Gate to the Sacramento and San Joaquin Rivers, and the lower reaches of various streams that flow directly into the Bay, such as the Napa and Petaluma Rivers in the North Bay and the Coyote and San Francisquito Creeks in the South Bay.

The nine-county Bay Area contains a total of 28 groundwater basins. The ten primary groundwater basins are the Petaluma Valley, Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, and Santa Clara Valley basins. Groundwater in the Bay Area is used for numerous purposes, including municipal and industrial water supply; however, groundwater use accounts for only about five percent of the total water usage.

The quality of regional surface water and groundwater resources is affected by point-source and nonpoint-source discharges throughout individual watersheds. Pollutants that enter water bodies in urban runoff include oil and gasoline by-products from parking lots, streets, and freeways. In addition, impervious surfaces increase runoff quantities, taxing flow capacities of local flood control systems. Regionally, stormwater runoff is estimated to contribute more heavy metals to the San Francisco Bay than direct municipal and industrial dischargers, as well as significant amounts of motor oil, paints, chemicals, debris, grease, and detergents. Runoff in storm drains may also include pesticides and herbicides from lawn care products and bacteria from animal waste.

##### **1.2.2.4.2 Environmental Impacts**

Additional water demand and wastewater generation impacts are expected to result from the operation of several of the possible control technologies that would most likely be used if any refineries are required to reduce SO<sub>2</sub> and PM<sub>2.5</sub> due to a failure to demonstrate NAAQS compliance, or if additional TAC emission reductions are required as a result of updating the affected refineries' HRAs. The precise data from each refinery operator for each piece of equipment possibly affected, and estimates of project water demand impacts is currently not available.

#### **Construction Water Demand**

Demolition and construction activities to install air pollution control equipment have the potential to generate water demand and water quality impacts. Control equipment that

could impact demand and water quality includes ESPs, and wet gas scrubbers. For large air pollution control equipment site preparation activities requiring water for dust control would likely be necessary. If one Fuel Gas Treatment (FGT) unit (one of the largest types of potential is installed) the total peak amount of water that could be used for dust suppression is approximately 18,000 gallons per facility per day. Even if all five affected refineries were to install one FGT with construction and, therefore, dust control activities occurring on the same days water demand for construction (90,000 gallons per day) would not exceed any applicable water demand significance threshold (262,820 gallons per day). Once construction is completed, additional demand for water would end. Therefore, water demand for dust control activities would be much less than 90,000 gallons per day and is concluded to be less than significant. During construction, some types of new equipment and piping may need additional water so hydrotesting of the new equipment and connective piping could be performed. Water demand to perform hydrotesting of new equipment and piping, is not expected to exceed any applicable water demand significance thresholds and, therefore, is concluded to be less than significant. In conclusion, water demand impacts from dust control and hydrostatic testing activities would not cause or contribute to an exceedance of any applicable water demand significance thresholds and, therefore, are concluded to be less than significant.

### Operation Water Demand

Installation of wet ESPs would require additional water, which is used as part of the emission control process. The impacts of installing a wet ESP on future water demand at an affected refinery are not expected to exceed any applicable water demand significance thresholds and, therefore, are concluded to be less than significant.

Based on an evaluation of water demand impacts from installing a WGS, compared to the overall existing water demand of a typical refinery, daily water demand impacts from installing a wet gas scrubber could increase by approximately 0.6 to approximately two percent. Although small, depending on the size of the refinery and the number of refineries that install WGSs, this impact could exceed applicable water demand significance thresholds (262,820 gallons per day) and, therefore, is considered to be significant.

### Construction Water Quality

Water used for dust suppression activities typically wets the top one to two inches of soil, evaporates and then forms a soil crust. As a result, this water does not flow into storm drains, sewers or other water collection systems and, therefore, water quality impacts from dust suppression activities are concluded to be less than significant.

Because hydrotest water would most likely be comprised of wastewater diverted from other refinery equipment or processes, it is not expected that hydrotest water would contribute to and exceedance of a refinery's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Therefore, changes to existing permit conditions would not likely be required and no



violations of existing Industrial Wastewater Discharge Permits (IWDPs), National Pollutant Discharge Elimination System permits, or other wastewater permit limits are expected. Therefore, water quality impacts during construction are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during construction are concluded to be less than significant.

#### Operation Water Quality

Since additional water would be needed as part of the wet ESP's pollution control process the proposed project could increase the wastewater generated by each affected refinery. However, instead of clean water, it is likely that each affected refinery operator would utilize stripped sour water or similar existing treated waste process water from elsewhere within each facility. Because existing sources of refinery wastewater, e.g., stripped sour water or similar existing treated waste process water, could be used to operate a wet ESP, additional wastewater generated from installing new add-on control equipment would be minimal. Thus, the impacts of installing a wet ESP on each affected refinery's wastewater discharge volumes and their IWDPs are not expected to exceed any applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

Water from the WGS can be treated and then recirculated back to the wet gas scrubber to be used again. Changes to existing permit conditions would not likely be required and no violations of existing IWDPs, NPDES permits, or other wastewater permit limits are expected. Therefore, water quality impacts from a WGS are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during operation are concluded to be less than significant.

Water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

#### 1.2.2.4.3 Mitigation Measures

For any affected refinery that installs an air pollution control technology that increases demand for water, the following water demand mitigation measures will apply.

HWQ-1 When air pollution control equipment is installed and water is required for its operation, the refinery operator is required to use recycled water, if available, to satisfy the water demand for the air pollution control equipment.

HWQ-2 In the event that recycled water cannot be delivered to the affected refinery, the refinery operator is required to submit a written declaration with the application for a Permit to Construct for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

In spite of implementing the above water demand mitigation measures, operational water demand impacts remain significant.

With regard to water demand and water quality impacts during construction, it was concluded that impacts would be less than significant. Water quality impacts associated with operation of the proposed project is expected to be less than significant.

#### 1.2.2.4.4 Cumulative Impacts

Impacts from construction water demand and water quality would be less than significant. Also, water quality impacts from the proposed project during operation would be less than significant. Because construction water quality and water demand impacts and operational water quality impacts were concluded to be less than significant, they are not considered to be cumulatively considerable. Water demand impacts during operation of the proposed project are considered to be cumulatively considerable.

#### 1.2.2.5 Growth Inducing Impacts

CEQA defines growth-inducing impacts as those impacts of a proposed project that “could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth”. The proposed new rules would not be considered growth-inducing, because they would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

#### 1.2.2.6 Significant Environmental Effects Which Cannot be Avoided and Significant Irreversible Environmental Changes

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. As evaluated in the portions of Chapter 3 of this EIR, the proposed amendments would result in potentially significant unavoidable impacts on air quality (criteria pollutants) during construction activities, greenhouse gas emissions during construction activities and hydrology and water quality (water demand) during project operational activities.

#### 1.2.2.7 Environmental Effects Not Found to be Significant

The following topics of analysis in this EIR were found to have no potentially significant adverse effects, after mitigation: Air Quality (during project operation); Greenhouse Gases (during project operation); Hazardous and Hazardous Materials; and Water Quality.

The following topics of analysis were found to have no potentially significant adverse effects in the Initial Study (see Appendix A): Aesthetics; Agriculture and Forestry

Resources; Biological Resources; Cultural Resources; Geology/Soils; Land Use/Planning; Mineral Resources; Noise; Population/Housing; Public Services; Recreation; Transportation/Traffic; and Utilities and Service Systems.

### **1.2.3 EXECUTIVE SUMMARY – CHAPTER 4: ALTERNATIVES**

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR the proposed project could result in potentially significant impacts to air quality and GHG emissions during construction and hydrology (water demand) during project operation. An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)).

Alternative 1 is the No Project Alternative. Under the Alternative 1, neither Regulation 12-15 or 12-16 would be adopted or implemented. The Alternative 1 would reduce the potentially significant impacts associated with construction criteria pollutant and GHG emissions and water demand associated with the potential installation of additional air pollution control equipment to less than significant. The potential beneficial impacts of the proposed project associated with additional emission reductions of SO<sub>2</sub>, PM<sub>2.5</sub>, and TACs would also be eliminated under Alternative 1. Since the need for emission reductions has not yet been determined, the amount of emissions reductions that would not occur under Alternative 1 is unknown. Alternative 1 would not achieve any of the project objectives.

Alternative 2 would implement Regulation 12-15 only and Regulation 12-16 would not be implemented at this time. Under Alternative 2, the refineries would be required to develop emission inventories, conduct air monitoring, report of crude slate characteristics, and complete energy audits. However, under Alternative 2, no additional emission reductions or health risk reduction measures would be implemented. The Alternative 2 would reduce the potentially significant impacts associated with construction criteria pollutant and GHG emissions and water demand associated with the potential installation of additional air pollution control equipment to less than significant. The potential beneficial impacts of the proposed project associated with additional emission reductions of SO<sub>2</sub>, PM<sub>2.5</sub>, and TACs would also be eliminated under Alternative 2. Since the need for emission reductions has not yet been determined, the amount of emissions reductions that would not occur under Alternative 2 is unknown. Alternative 2 would achieve six of the eight project objectives.

Since Alternative 2 would eliminate all of the potentially significant impacts and achieve most of the project objectives, it would be considered the environmentally superior alternative.

## **CHAPTER 1: INTRODUCTION**

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The proposed project would be considered the preferred alternative as it would achieve all of the objectives and potentially result in reduced overall emissions in the Air Basin, providing an improvement in air quality not provided by the other project alternatives.

### **1.2.4 EXECUTIVE SUMMARY – CHAPTER 5: REFERENCES**

Information on references cited (including organizations and persons consulted) is presented in Chapter 5.



**TABLE 1.1-1  
Summary of Environmental Impacts, Mitigation Measures and Residual Impacts**

Impact	Mitigation Measures	Residual Impacts
<b>Air Quality</b>		
<p>The construction phase of the proposed project could regional significance thresholds for criteria pollutants and are potentially significant.</p>	<p>A-1 Develop a Construction Emission Management Plan,                      A-2 Minimize emissions from vehicles including consolidating truck deliveries,                      A-3 Prohibit idling in excess of five minutes,                      A-4 Maintain construction equipment to optimize emissions,                      A-5 Utilize electric welders in areas served by electricity,                      A-6 Utilize on-site power where available instead of temporary generators,                      A-7 Utilize cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines,                      A-8 Use equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines, and                      A-9 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts.</p>	<p>Construction emissions for criteria pollutants are expected to remain significant following mitigation.</p>

**TABLE 1-1 (cont.)**

<b>Impact</b>	<b>Mitigation Measures</b>	<b>Residual Impacts</b>
The operation phase of the proposed project will not exceed the regional significance thresholds for criteria pollutants.	None required.	No significant impacts
Potential impacts of TAC from Wet Gas Scrubbers and Fuel Gas Treatment are not expected to exceed the applicable cancer and non-cancer health risk significance thresholds	None required	Less than significant
<b>Greenhouse Gases</b>		
GHG emission impacts from construction of the proposed project are potentially significant.	GHG-1 Incorporate best management practices specifically to reduce GHG emissions during construction. GHG-2 Use alternative fueled construction vehicles or equipment of at least 15 percent of the fleet. GHG-3 Use at least 10 percent local building materials. GHG-4 Recycle or reuse at least 50 percent of construction waste or demolition materials. GHG-5 When air pollution control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the control equipment.	Construction GHG emissions are expected to remain significant following mitigation.

TABLE 1-1 (cont.)

Impact	Mitigation Measures	Residual Impacts
Direct GHG emission impacts from air pollution control equipment are expected to be less than significant because all refineries and electric generating facilities are under CARBs Cap-and-Trade program and GHG emission increases would be offset.	None required.	Less than significant
Indirect GHG emission impacts from haul trucks transporting fresh supplies of caustic are less than significant.	None required.	Less than significant
<b>Hazards and Hazardous Materials</b>		
Hazards associated with the replacement of existing Internal Combustion Engines (ICEs), and installation of fuel gas treatment equipment, selective oxidation catalysts, SOx reducing additives, and wet gas scrubbers are expected to be less than significant.	None required.	Less than significant
The hazards associated with the installation and operation of baghouses are potentially significant.	HHM-1 Maintain a comprehensive dust control program, with hazard dust inspections, testing, housekeeping, and control initiatives. HHM-2 Ground the filter elements using grounding wires, rods, etc., to prevent sparks that could be generated during cleaning. HHM-3 Install additional explosion rupture panels and vent outdoors. HHM-4 If the collector filters are to be replaced the first procedure is to remove as much flammable or explosive dusts from the filters as possible.	Hazard impacts are considered to be less than significant following mitigation.



**TABLE 1-1 (cont.)**

<b>Impact</b>	<b>Mitigation Measures</b>	<b>Residual Impacts</b>
Hazards associated with baghouse operations (cont.)	HHM-5 Perform all hot work (welding, acetylene cutting, grinding, etc.) away from the collector, if possible. HHM-6 Ensure that power tools and impact hand tools are not used in high dust concentrations. . HHM-7 Ensure adherence to National Fire Protection Agency (NFPA) standards	
The hazards associated with the installation and operation of dry Electro-Static Precipitators (ESPs) are potentially significant.	HHM-8 Equip dry ESPs with CO to monitor CO concentrations. HHM-9 Modern digital electronic controls shall be used to automate the CO monitoring process. HHM-10 The bottom and top of each wire should be covered with shrouds to help minimize sparking and metal erosion at these points. HHM-11 To further reduce fire and explosion hazards, affected refinery operators shall establish the inspection frequency of all dry ESP components through a formal in-house maintenance procedure. Vendors' recommendations for an inspection schedule shall be followed and shall include at a minimum, the following procedures	The hazard impacts associated with dry ESPs are expected to be less than significant following mitigation.

TABLE 1-1 (cont.)

Impact	Mitigation Measures	Residual Impacts
<b>Hydrology and Water Quality</b>		
Water demand during construction is limited to water applied for dust suppression and water to perform hydrostatic testing and is expected to be less than significant.	None required.	Construction water demand impacts are less than significant.
The water demand associated with operating wet ESPs are expected to be less than significant.	None required.	Less than significant.
The water demand associated with operating Wet Gas Scrubbers (WGS) are potentially significant.	<p>HWQ-1 When air pollution control equipment is installed and water is required for its operation, the refinery operator is required to use recycled water, if available.</p> <p>HWQ-2 In the event that recycled water cannot be delivered to the affected refinery, the refinery operator is required to submit a written declaration with the application for a Permit to Construct for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.</p>	Water demand associated with the WGS operations will remain significant following mitigation.
Water quality during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing of new tanks and pipelines, and is expected to be less than significant.	None required.	Construction water demand impacts are less than significant.

**TABLE 1-1 (Concluded)**

<b>Impact</b>	<b>Mitigation Measures</b>	<b>Residual Impacts</b>
Water quality impacts associated with installing wet ESPs and WGS is expected to be less than significant.	None required.	Operational wastewater impacts are less than significant.

## **CHAPTER 2**

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### **PROJECT DESCRIPTION**

Introduction  
Project Location  
Project Objectives  
Background and Project Description  
Refinery Units That May Be Affected by the Proposed Project  
Applicable SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC Technologies



## 2.0 PROJECT DESCRIPTION

### 2.1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD or District) is proposing two new rules that would apply to petroleum refineries located in the San Francisco Bay Area. The titles of the proposed new rules are Regulation 12, Rule 15 (Regulation 12-15): Petroleum Refining Emissions Tracking (herein “Tracking Rule”); and Regulation 12, Rule 16 (Regulation 12-16): Petroleum Refining Emissions and Risk Limits, (herein “Emission Limits Rule”).

Regulation 12-15 is being proposed to establish requirements to enhance the tracking of refinery emissions and crude oil composition over time, as well as increase air monitoring activities at refinery fence lines and in the nearby community. Tracking this information would enable the Air District to use emissions inventory data, crude oil information, and air monitoring data to identify any potential relationship between crude oil quality and emissions of air pollutants. In addition, the draft Tracking Rule would require each refinery to prepare an updated Health Risk Assessment (HRA) using the latest assessment methodology and health effects data to provide additional information regarding health impacts from the emissions of toxic air pollutants at refineries. The collection of energy efficiency information would allow comparisons on a refinery-by-refinery basis and aid in the potential identification of possible increases in efficiency of equipment and processes. Regulation 12-16 would utilize the AB 2588 Air Toxic “Hot Spots” Program to establish lower toxic risk levels for refineries. Regulation 12-16 would establish maximum refinery-wide emissions limits for sulfur dioxide (SO<sub>2</sub>) and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>) at each Bay Area refinery and specific support facilities based on the potential to emit levels for all sources. Regulation 12-16 would require refinery operators to demonstrate that their facilities will not cause an exceedance of the National Ambient Air Quality Standards (NAAQS) for SO<sub>2</sub> and PM<sub>2.5</sub>, when operating at their maximum allowed emission rate, through modeling or monitoring. The rule also would require refinery operators to develop an emission reduction plan for District review and approval that would detail the measures that would be implemented and a schedule of implementation to comply with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub> if the refinery operators could not demonstrate compliance with these standards.

### 2.2 PROJECT LOCATION

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District 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. 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

(see Figure 2.2-1). Proposed Regulations 12-15 and 12-16 would affect five refineries within the Bay Area.

### **2.3 PROJECT OBJECTIVES**

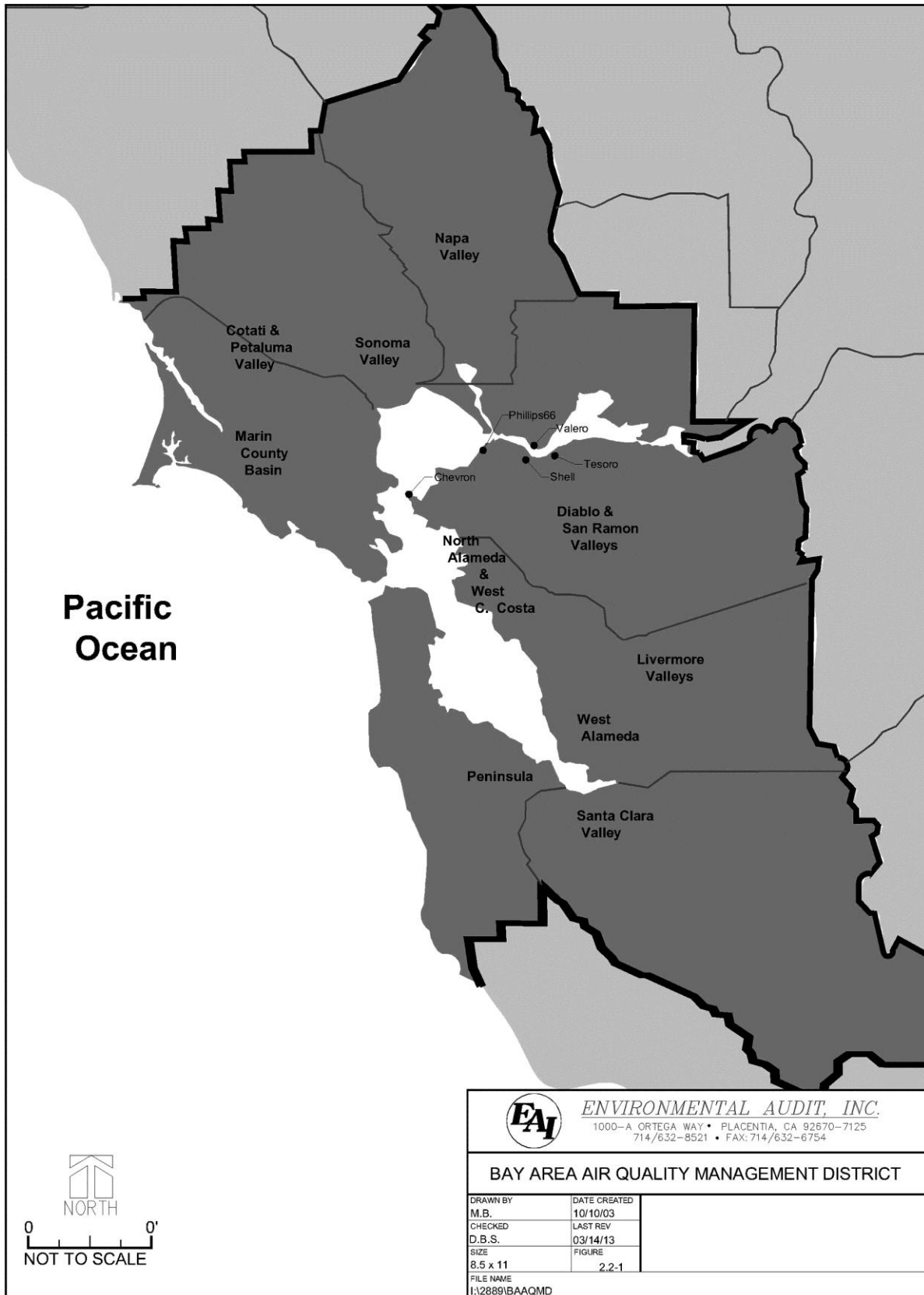
The U.S. EPA has set primary national ambient air quality standards for air pollutants to define the levels considered safe for human health. The California Air Resources Board (CARB) has also set California ambient air quality standards. The Bay Area is a non-attainment area for the state one-hour ozone standard and federal eight-hour ozone standard. In addition, 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 PM<sub>2.5</sub>. The ultimate goal of the District's rules and regulations is to attain and maintain compliance with the state and federal ambient air quality standards.

The objective of the proposed new rules is for the District to gather additional emissions inventory and crude slate information from refineries; increase air monitoring activities at refinery fence lines and in nearby communities; require HRAs be performed using the latest assessment methodology and health effects data to provide additional information regarding health impacts from the emissions of toxic air pollutants at refineries; and demonstrate that the refineries can comply with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub> when operating at maximum permitted levels. The collection of energy efficiency information would allow comparisons on a refinery-by-refinery basis and aid in the potential identification of possible increases in efficiency of equipment and processes.

The specific objectives of the proposed rule amendments for the District are the following:

- Accurately and consistently characterize emissions of all pollutants (criteria, toxic, and greenhouse gases) from refinery-related emissions sources in an on-going basis;
- Analyze significant changes to the crude slate (such as the refining of heavier and/or more sour crude oil) to determine whether such changes will result in increased emissions of air pollutants.
- Ensure refineries comply with the ambient air quality standards for SO<sub>2</sub> and PM<sub>2.5</sub>;
- Determine the energy efficiency of the refineries;
- Determine the level of toxic exposure and risk refineries pose to the residents of nearby communities;

**CHAPTER 2: PROJECT DESCRIPTION**





- Ensure refinery toxic emissions do not pose an unacceptable health risk to the residents of their nearby communities; and
- Provide information to the public on refinery emissions, and any significant crude slate changes, and health risk impacts.

## **2.4 BACKGROUND AND PROJECT DESCRIPTION**

The District is proposing new Regulations 12-15 and 12-16, the details of which are summarized in this subsection. The specific proposed rules are included in Appendix A of this EIR.

### **2.4.1 BACKGROUND**

Currently five petroleum refineries are located in the Bay Area within the jurisdiction of the Air District (see Figure 2.2-1):

- Chevron Products Company (Richmond),
- Phillips 66 Company – San Francisco Refinery (Rodeo),
- Shell Martinez Refinery (Martinez),
- Tesoro Refining and Marketing Company (Martinez), and
- Valero Refining Company – California (Benicia).

The draft rules would also address five refinery-related facilities:

- Two sulfuric acid plants
- Two hydrogen plants
- One coke calcining plant (a refinery by-product)

Petroleum refineries convert crude oil into a wide variety of refined products, including gasoline, aviation fuel, diesel and other fuel oils, lubricating oils, and feed stocks for the petrochemical industry. Crude oil consists of a complex mixture of hydrocarbon compounds with smaller amounts of impurities including sulfur, nitrogen, oxygen and metals (e.g., iron, copper, nickel, and vanadium). Crude oil that originates from different geographical locations may vary with respect to its composition.

Air pollutants are categorized and regulated based on their properties and there are three primary categories of regulated air pollutants: (1) criteria pollutants; (2) toxic air

contaminants; and (3) greenhouse gas emissions. Additional categories of air pollutants include odorous compounds and visible emissions.

Criteria pollutants are emissions for which Ambient Air Quality Standards (AAQS) have been set and include: (1) carbon monoxide (CO); (2) nitrogen dioxide (NO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>); (3) particulate matter (PM) in two size ranges -- diameter of 10 micrometers or less (PM<sub>10</sub>); and diameter of 2.5 micrometers or less (PM<sub>2.5</sub>); (4) volatile organic compounds (VOC); and (5) sulfur dioxide (SO<sub>2</sub>). Each of these criteria pollutants are emitted by petroleum refineries.

Toxic air contaminants (TACs) are emissions for which AAQS have generally not been established, but may result in human health risks. The state list of TACs currently includes approximately 190 separate chemical compounds, and groups of compounds. TACs emitted from petroleum refineries include volatile organic TACs, semi-volatile and non-volatile organic TACs, metallic TACs, and other inorganic TACs.

Climate pollutants (e.g., greenhouse gases, or GHGs) are emissions that include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and three groups of fluorinated compounds (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>)), and are the major anthropogenic GHGs. GHGs emitted from petroleum refineries include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

The proposed regulatory approach for Regulations 12-15 and 12-16 are summarized below.

**Regulation 12, Rule 15**

- Report on-going annual emissions inventories of all regulated air pollutants based on consistent upgraded methods, including emissions from cargo carriers;
- Develop a Petroleum Emissions Profile (PREP) based on three years of emissions inventory and require that on-going inventories include comparisons with the PREP;
- Report on-going crude oil and other feedstock characteristics with annual emissions inventories;
- Require an update of refinery HRAs based on the most recent Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) guidelines;
- Report Energy Audit results so that the Air District can determine which refineries have options for reducing GHG emissions through economically and technically feasible improvements in energy efficiency; and
- Establish fence-line and community air monitoring systems.

### **Regulation 12, Rule 16**

- Establish maximum potential to emit limits for SO<sub>2</sub> and PM<sub>2.5</sub> from all permitted sources (including grandfathered sources) at each Bay Area refinery and specific support facilities;
- Require refinery operators to demonstrate that their facilities will not cause an exceedance of the NAAQS for SO<sub>2</sub> or PM<sub>2.5</sub> when operating at their maximum allowed emission rate through modeling or monitoring; and
- Require the submission, approval, and implementation of a Risk Reduction Audit and Plan (under AB 2588 Toxic “Hot Spots” Program) to reduce the refinery risk if an Air District-approved HRA indicates that the refinery risk to the surrounding community exceeds the action levels.

### **2.4.2 PROJECT DESCRIPTION**

The description of proposed Regulation 12-15 and Regulation 12-16 are provided below.

#### **2.4.2.1 Regulation 12, Rule 15**

Regulation 12-15 is referred to as the refinery Tracking Rule and includes requirements to track and monitor criteria and toxic air emissions from refineries (GHG emissions are also required to be tracked), which are summarized below.

##### **2.4.2.1.1 Administrative Procedures**

The proposed Tracking Rule would require refinery owner/operators to submit to the BAAQMD various reports and plans, subject to review by members of the public and other interested stakeholders. Comments received would be considered by District staff prior to taking final action to approve, revise, or disapprove the reports and plans. Commenters would be notified of the District’s final actions, and approved reports and plans would be posted on the District’s website.

It should be noted that California law specifies that “trade secrets” are not public records. While air pollutant emissions data and air monitoring data may not be considered trade secrets, many other types of information may be (e.g., production data used to calculate emissions data). Section 12-15-411 of the proposed rule specifies that a refinery owner/operator may designate as confidential any information required to be submitted under the rule that is claimed to be exempt from public disclosure under the California Government Code. The owner/operator is required to provide a justification for this designation, and must submit a separate public copy of the document with the information that is designated “confidential” redacted.

2.4.2.1.2 Pollutant Coverage

The proposed Tracking Rule would cover the three primary categories of regulated air pollutants: (1) Criteria pollutants emissions; (2) TAC emissions; and (3) GHG emissions. These terms are defined in Sections 12-15-204, 221, and 209 of the proposed rule. The definition of TAC provided in Section 12-15-221 of the proposed rule refers to the State TAC list and includes those State TACs that have a basis for the evaluation of health effects under guideline procedures adopted by OEHHA for the Air Toxics Hot Spots Program.

Unlike criteria pollutants and TACs, GHGs are not directly associated with localized or regional health risks, which is the primary issue that the new rule is intended to address. GHGs are included in the proposed rule and are required to be reported to address climate change issues.

Odorous and visible emissions are not specifically proposed to be covered by the new rule, although most of these pollutants are also included in one of the categories of regulated air pollutants that would be covered (e.g., hydrogen sulfide, which is the primary odorous compound emitted from refineries, is a covered TAC; visible emissions are typically fine particulate matter (PM<sub>2.5</sub>), a covered criteria pollutant).

2.4.2.1.3 Source Coverage

The proposed Tracking Rule would apply to all air emissions from “stationary sources” at petroleum refineries. Stationary sources, as opposed to mobile sources such as trucks and other vehicles, are the sources over which the District has regulatory jurisdiction. However, there are instances in which the Air District desires to understand emissions from these mobile sources, such as when ships and trains are unloading or loading products at the refinery, and thus emissions from these operations are included in the requirements of the rule. This concept is addressed in the definition of “emissions inventory” in Section 12-15-207. Several other definitions in the proposed rule are intended to clarify source coverage. This includes the definition of “petroleum refinery” in Section 12-15-214, the definition of “source” in Section 12-15-220 (which is the same definition used in the Air District’s permit rule), and the definition of “emissions inventory” in Section 12-15-207.

The proposed Tracking Rule would apply to petroleum refinery operations whether or not these operations are owned or operated by different entities. For example, some Bay Area refineries include co-located hydrogen plants that are owned or operated by separate companies, but that provide hydrogen for refinery operations. Similar arrangements also exist for refinery terminal operations, and auxiliary facilities (e.g., cogeneration plants). The definition of “refinery owner/operator” provided in Section 12-15-217 of the proposed rule indicates that the refinery owner/operator is responsible for the submittal of required reports and plans that cover the entire refinery, including those that may be separately owned or operated.

Processing crude oil from new sources may result in increased emissions. As a result, the draft Tracking Rule would require that each refinery report its “crude slate” as defined in Section 12-15-206 containing information regarding sulfur and nitrogen content, API gravity, total acid number, and other properties as described in Section 12-15-401.7. By gathering this information about crude oil and other pre-processed feedstocks fed into the refinery processes, the Air District intends to analyze the relationship between the crude slate, processing intensity and resulting emissions.

#### 2.4.2.1.4 Emissions Inventory Development

Emissions inventories are used in a variety of air quality programs, and methodologies for establishing these inventories are provided in various publications. Depending on the specific type of source, and the specific type of air pollutant emitted, state-of-the-art emissions inventory techniques may involve continuous emission monitors, source-specific emission tests, general emission factors (i.e., representative values that relate the quantity of a pollutant emitted with an activity associated with the release of that pollutant), material balances, or empirical formulae.

Due to the diversity of emissions inventory methodologies that exist, and the need to update these methodologies on an on-going basis due to improvements in scientific understanding and available data, the Tracking Rule does not include detailed emissions inventory methodologies. As reflected in Section 12-15-409 of the proposed rule, the District staff would publish, and periodically update, emissions inventory guidelines for petroleum refineries that specify the methodology to be used for emissions inventories required under the rule. Section 12-15-601 indicates that emissions inventories submitted under the rule must be prepared following District-published guidelines.

The initial refinery emissions inventory guideline document has been developed concurrently with the development of the proposed new rule. That document refers heavily to other inventory methodology publications, including the refinery emissions protocol issued for the purpose of improving emissions inventories as collected through the U.S. EPA’s 2011 Information Collection Request (ICR) for the petroleum refining industry (Emission Estimation Protocol for Petroleum Refineries).

The BAAQMD has used staff-published guideline documents in combination with other rules that have requirements based on detailed technical information that needs to be updated on an on-going basis. This includes the Air District’s BACT/TBACT Workbook and Permit Handbook (both used in Air District Rules 2-2 and 2-5), and Health Risk Screening Guidelines (used in Air District Rules 2-1 and 2-5).

2.4.2.1.5 Emissions Inventories and Crude Slate Report

Emissions Inventories Report

The establishment of existing annual emissions inventories will provide the basis in the new rule for determining emissions that occur from each refinery year to year and will be used to develop a Petroleum Refinery Emissions Profile (PREP). In addition, each refinery would be required to provide information on the crude slate, as described above, that the District would use to analyze the relationships between emissions and crude and pre-processed feedstock input to the refinery. Each refinery would be required to prepare and submit an annual refinery emissions inventory and crude slate report to the District as specified in Section 12-15-401 of the proposed rule. The public is provided an opportunity to provide input regarding emissions inventory and crude slate reports as described in Section 12-15-404.

Crude Slate Report

The crude slate report required as part of Rule 12–15 will address the following parameters:

- Total volume processed by the crude unit(s) and other pre-processed feedstocks that are processed at other process units;
- API gravity as it relates to higher crude density;
- Sulfur content;
- Nitrogen content;
- Acid content;
- Vapor pressure;
- Total Reduced Sulfur (hydrogen sulfide and mercaptan content); and
- Selected metals (nickel, vanadium) content.

The refinery operators are required to collect monthly values on each of these parameters and report that information to the District on an annual basis.

2.4.2.1.6 Establishing Petroleum Refinery Emissions Profiles

Emissions can fluctuate from year to year due to market forces or other factors not necessarily related to normal refinery operation. Multiple annual emissions inventories are required to develop a more complete understanding of emissions and help determine which sources might require additional emissions reductions. Under the proposed Regulation 12-15, each refinery would be required to prepare and submit to the District a PREP, as specified in Section 12-15-402. The PREP would include a summary of the average emission rate of each criteria pollutant, TAC and GHG that was emitted from each source and from the refinery on an annual basis.

Although refinery operations are more continuous and uniform than some other types of industries, year-to-year variations in emissions occur due to a variety of factors. Some of these factors include business cycles that affect the demand for products produced, and cyclical process unit maintenance turnarounds (which generally occur on different schedules at different refineries).

A variety of other factors may affect variations in year-to-year emissions from a refinery, including the addition of emissions controls, equipment changes (e.g., replacements, modernizations, and expansions), maintenance activities (e.g., refinery turnarounds), accidents, compliance issues, changes in feed stocks used, and the mix of products produced due to business decisions. As a result of these fluctuations, refinery owners/operators may choose any consecutive 12-month period over the last six years to define annual emissions in the PREP. The annual ongoing emissions inventories will be compared to the PREP to see variations of emissions from year-to-year and over time and will be compared to changes in crude oil composition to determine if crude composition changes have a major impact on emissions. The public would have an opportunity to provide input regarding emissions inventory and crude slate reports as described in Section 12-15-404.

#### 2.4.2.7 Revising Petroleum Refinery Emissions Profile Reports

In addition to specifying the annual emission inventory for each refinery, and identifying the changes in emissions that occurred relative to the PREP as described in Section 12-15-401.5, the On-going Emissions Inventory and Crude Slate Report would incorporate any improvements in emissions inventory methodologies used. Section 12-15-403 would provide a way to incorporate these changes in emissions inventory methodologies into the PREP. Section 12-15-403 would also cover potential expansions of the emissions inventory over time to address additional compounds that may be added to the OEHHA health effects values list, and will ensure that a uniform basis exists for determining changes in emissions over time. Any revisions to the PREP are required to be submitted no later than the date the emissions inventory affected by the changes in methodology is required.

#### 2.4.2.1.8 Health Risk Assessments

The BAAQMD uses a variety of tools to determine where health hazards may be occurring in the Bay Area, to assess the relative magnitude of these health hazards compared to other locations, and to determine how to best focus District resources in order to reduce these health hazards. HRAs are one of the tools that can be used to assess the relative magnitude of health hazards. HRAs are designed to quantify the potential health impacts to an individual or to a community that may be attributable to specific sources or facilities, or that may occur in the future as a result of proposed projects or proposed changes at a facility. For the purposes of Rule 12-15, an HRA is defined in Section 12-15-210.

An HRA consists of four basic steps: 1) hazard identification; 2) exposure assessment; 3) dose response assessment; and 4) risk characterization. The District conducts HRAs using standardized methodologies for each of these steps. As indicated in Sections 12-15-210 and 12-15-602 of the proposed rule, HRAs will be prepared in accordance with the most recent guidelines adopted by the OEHHA. The District follows these OEHHA HRA Guidelines when conducting HRAs under the Air Toxic Hot Spots Program.

Regulation 12-15 will require that each refinery conduct an HRA using the most recent OEHHA HRA guidelines along with more refined emissions inventories. This requirement is outlined in Section 12-15-405. The public would have an opportunity to review and comment on the HRA Modeling Protocol and the HRA, as described in Section 12-15-406.

### 2.4.2.1.9 Air Monitoring

The proposed Tracking Rule would require the refinery owner/operator to prepare and submit to the District an air monitoring plan for establishing and operating a fence-line monitoring system and a community air monitoring system (see Section 12-15-407). The terms “fence-line monitoring system” and “community air monitoring system” are defined in the proposed rule in Sections 12-15-208 and 203, respectively. The air monitoring plans would need to be prepared in accordance with air monitoring guidelines that are published by the District (see Sections 12-15-410 and 603).

The initial air monitoring guideline document was developed concurrently with the development of the proposed rule. Much of the information gathering for the guideline document is being completed under Action Item 3 of the District’s Work Plan for Action Items Related to Accidental Releases from Industrial Facilities. Under this Action Item, the District retained a contractor to create a report that identifies equipment and methodological options for monitoring systems. A panel of monitoring experts gathered from academia, industry, the community, and other government agencies then discussed and weighed the various options and provided input to guide the District in developing the air monitoring guidelines.

Under the proposed rule, within one year of District approval of a refinery’s air monitoring plan, the refinery owner/operator would be required to ensure that fence line monitoring systems are operational. Within two years after District approval of the air monitoring plan, the community air monitoring systems would be required to be operational. Both systems would be installed, operated, and maintained, in accordance with the approved plan (see Sections 12-15-501 and 502 of the proposed rule).

The Air District would review the initial air monitoring guideline document within a five-year period of the publication of the initial guideline document. The guidelines would be updated if necessary in consideration of advances in monitoring technology, updated information regarding the health effects of air pollutants, and review of data collected by existing monitoring systems required under the rule. The refinery owner/operator would



be required to implement any needed modifications to existing monitoring systems within one year of publication of the updated guidelines.

#### 2.4.2.1.10 Energy Audit

Although the GHG Cap-and-Trade program under AB 32 requires an overall GHG emission reduction in the state, it is possible that Bay Area refineries will partially meet their GHG reduction requirements by purchasing GHG allowances generated outside the Bay Area.

The Energy Audit element of Rule 12-15 (Section 12-15-412) would provide refinery data that District staff could use to determine the energy efficiency of the Bay Area refineries. If there are areas of energy management that can be significantly improved, and especially if the refineries opt to purchase GHG allowances rather than implement best practices in energy management, the Energy Audit would allow Air District staff to determine whether a targeted rule-making should be pursued to achieve actual GHG emission reductions at Bay Area refineries in order to ensure the achievement of GHG emissions reduction goals.

The draft rule would seek specific data from the biennial “Fuels Study” report on energy management that is developed for the refineries (most recently in 2014) by consulting firm Solomon Associates. The draft rule also includes a requirement for the refinery operators to submit a follow-up energy gap analysis based on 2014 data that would be delivered to the refineries in early 2016.

### 2.4.2.2 Regulation 12, Rule 16

Regulation 12-16 is referred to as the refinery Emission Limits Rule and includes requirements to establish emission thresholds and develop mitigation plans should those thresholds be exceeded. The requirements of Regulation 12-16 are summarized below.

#### 2.4.2.2.1 Administrative Procedures

The Emission Limits Rule would require various reports and plans be submitted to the District and are subject to public review. Comments received from the public would be considered by BAAQMD staff prior to taking final action. Commenters would be notified of final actions and approved reports and plans would be posted on the District’s website. The administrative procedures the District would use to review and take final action to approve or disapprove the various types of required reports and plans are specified in Sections 12-16-400 of the proposed Rule 12-16.

#### 2.4.2.2.2 Refinery Maximum Allowable Risk Levels

In 1990, the Air District adopted the current risk management thresholds pursuant to the Air Toxic “Hot Spots” Act of 1987. These risk management thresholds which are currently in effect are summarized in Table 2.4-1.

**TABLE 2.4-1**

**Existing Bay Area Air Toxics Hot Spots Program Risk Management Thresholds**

	<b>Site Wide Cancer Risk</b>	<b>Site Wide Non-Cancer Hazard Index</b>
Public Notification	Greater than 10 in one million	Greater than 1
Mandatory Risk Reduction	Greater than 100 in one million	Greater than 10

Table 2.4-2 outlines the proposed new risk thresholds for refinery risk management proposed under Rule 12-16.

**TABLE 2.4-2**

**Proposed Risk Management Thresholds for Bay Area Petroleum Refineries**

	<b>Refinery-Wide Cancer Risk Levels</b>	<b>Refinery-Wide Non-Cancer, Acute and Chronic Hazard Indices</b>
Notification Risk	10 in one million	1.0
Significant Risk	25 in one million	2.5
Unreasonable Risk	100 in one million	10

If any of these thresholds are exceeded, action by refinery operators would be required. Specifically, notification would be required to be sent to potentially exposed people, as determined by the HRA, if the public notification threshold were to be exceeded; or development, approval, and implementation of a risk reduction plan would be required if the significant risk level were to be exceeded. Exceeding the “unreasonable” risk level would require an accelerated schedule for the implementation of an Air District-approved risk reduction plan.

2.4.2.2.3 Pollutant and Source Coverage

Since the Regulation 12-16, the Emission Limits Rule, is designed to work in tandem with the Regulation 12-15, Tracking Rule, many of the pollutants and sources covered are the same. Refineries would be required to develop and implement an Emission Reduction Plan (ERP) that would ensure compliance with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub> unless they could demonstrate compliance by air quality modeling at the maximum potential to emit levels for all sources or by air monitoring. If compliance with the NAAQS cannot be demonstrated through modeling or monitoring, the refinery operators would be required to submit an ERP. The ERPs would be required to demonstrate refinery emission reductions needed to comply with the NAAQS and would only be required when refineries could not demonstrate compliance with the NAAQS for SO<sub>2</sub>

and PM<sub>2.5</sub>. ERPs can propose reductions at any source that will bring overall refinery emissions down to a level consistent with protection of the health of neighboring communities. This will allow flexibility to determine the most effective measures to reduce emissions.

Regulation 12-16 would also determine maximum emission limits for SO<sub>2</sub> and PM<sub>2.5</sub> for all permitted sources at each refinery based on the maximum potential to emit from all sources. These limits would be used to establish a cumulative maximum emissions limits for all refinery operations..

#### 2.4.2.2.4 Risk Management Requirements and HRAs

Proposed Rule 12-16 would be used to determine if petroleum refinery emissions of toxic pollutants pose unacceptable health impacts to residents living in communities adjacent to refineries. This result is expected to be accomplished through the codification of the AB 2588 “Hot Spots” Program / SB 1731 Risk Reduction Audit and Plan requirements into draft Rule 12-16 (H&SC Section 44390 *et seq.*). This approach uses an existing state health protection law, the purpose of which is to ensure that sources of toxic pollutants do not pose an unacceptable risk to the residents of the communities in which they are located. The District would set a significant risk level at a cancer risk of 25 in one million and acute and chronic Hazard Indices (HI) at 2.5 (see Table 2.4-1).

- Under draft Rule 12-15, refinery operators must submit a new HRA (using the updated OEHHA protocols and health risk values) to the Air District as defined in Section 12-15-405. Draft Rule 12-16 would allow the Air District to request new or updated HRAs if criteria and toxic emissions inventories indicate a need for an update.
- If the refinery-wide HRA results exceed the notification level (either cancer risk of 10 in a million or acute or chronic HI of 1.0), the refinery operators are required to notify potentially exposed people at or above those levels of the results of the HRA (H&SC Section 44362(b)).
- If the refinery-wide HRA results exceed the significance level (either the cancer risk level of 25 in a million or the acute or chronic HI of 2.5), the refinery operator must:
  - Notify potentially exposed people (based on the HRA who are at a risk level of 10 in a million or an HI of 1.0 or more) of the results of the HRA (H&SC Section 44362(b)); and
  - Develop a toxic Risk Reduction Audit and Plan that would reduce health risk below the significant level within three to five years (H&SC Sections 44391(a) & (b)). The plan would include information such as: facility specifics; toxic pollutant source information; toxic pollutant emissions inventory; evaluation of risk reduction measures to be implemented

including a demonstration that the measure would reduce the refinery risk below the significant level, technical and economic feasibility; and a schedule of implementation.

- The Air District would review and approve the plan in a transparent process (subject to laws regarding confidentiality of trade secret information) and the refineries would have up to five years to implement the plans.
- If, following implementation of the risk reduction plan, the residual refinery-wide health risk remains in excess of the significant level or if the risk level exceeds the significant level for other reasons (increased throughput or changing crude or product slates), additional risk reduction measures may be required to ensure the risk level decreases and remains below the significant level.

#### 2.4.2.2.5 Limited Exemptions

The proposed Regulation 12-16 has two exemptions. The first exemption, contained in Section 12-16-102, applies to small refineries with a processing capacity of total crude oil of 5,000 barrels per day or less. This exemption is intended to limit the requirements of the rule to the five major Bay Area refineries and to exclude operations solely involving asphalt or oil recycling.

The second exemption deals with emissions from flares in Section 12-16-103. BAAQMD staff proposes that SO<sub>2</sub> and PM<sub>2.5</sub> emissions from flares are more appropriately addressed under Regulation 12, Rule 11, and Regulation 12, Rule 12.

## **2.5 REFINERY UNITS THAT MAY BE AFFECTED BY THE PROPOSED PROJECT**

If compliance with the NAAQS cannot be demonstrated through modeling or monitoring or the updated HRA shows TAC emissions exceed the significant risk thresholds, then the refinery operator's must submit to the Air District an Emission Reduction Plan or Risk Reduction Plan that identifies measures to reduce SO<sub>2</sub> or PM<sub>2.5</sub> emissions or cancer or non-cancer health risks, respectively. The most likely means of reducing SO<sub>2</sub> or PM<sub>2.5</sub> emissions or risk would be to further control emissions sources of these regulated pollutants at the refinery.

It is currently unknown whether or not any affected refineries would exceed any of the future refinery-wide emission limits for SO<sub>2</sub> or PM<sub>2.5</sub> or whether or not updating the HRAs would demonstrate exceedance of any significant risk thresholds. Further, if data submitted pursuant to Regulation 12-15 show that SO<sub>2</sub> or PM<sub>2.5</sub> emission reductions or risk reduction measures are required, it is not specifically known how refinery operators would comply with emission or risk reduction measures, including what equipment might be subject to further control or what types of control equipment would be used. However, some types of refinery equipment that emit SO<sub>2</sub>, PM<sub>2.5</sub>, and TACs can be

identified (see Table 2.5-1). The sections below identify and briefly describe typical types of refinery equipment that emit SO<sub>2</sub>, PM<sub>2.5</sub>, TACs and that would most likely be subject to further control, if required, as they tend to be the largest sources of emissions that may be affected by Regulation 12-16. In some cases, refinery equipment may emit one pollutant or any combination of pollutants subject to Regulations 12-15 and 12-16. Similarly, the most likely types of SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emission control technologies associated with the largest SO<sub>2</sub>, PM<sub>2.5</sub> or TAC emission sources at an affected refinery can also be identified (see Table 2.5-1). In some cases, control equipment identified below may reduce one or more pollutants subject to the proposed project. Potential secondary impacts from the control equipment identified below have been further analyzed in Chapter 3.

**TABLE 2.5-1**

**Control Technologies by Source Category and Pollutant**

Equipment Type	Pollutant		
	SO <sub>2</sub>	PM <sub>2.5</sub>	TAC
Boiler	FGT	Baghouse; ESP	
Diesel Internal Combustion Engine		DPF, DOC, Electric Motor	DPF, DOC, Electric Motor
Fluid Catalytic Cracking Unit	WGS, SRA	Cyclone, ESP	
Petroleum Coke Calciner	WGS	Baghouse	Baghouse
Process Heater	FGT	Baghouse; ESP	
Sulfur Recovery Unit/ Tail Gas Treating Unit	WGS; SOC	WGS	

DPF = Diesel Particulate Filter; DOC = Diesel Oxidation Catalyst; ESP = Electrostatic Precipitator; FGT = Fuel Gas Treatment; SOC = SO<sub>x</sub> Oxidation Catalyst; SRA = SO<sub>x</sub> Reducing Additives; WGS = Wet Gas Scrubber;

**2.5.1. Fluid Catalytic Cracking Units (FCCUs)**

FCCUs are also considered major sources of secondary particulate emissions. Secondary particulate emissions are formed in the atmosphere as a result of one or several chemical reactions that cause physical transformations of their gaseous precursors. Sulfates and nitrates are the two most common secondary particulates in the atmosphere. Other typical emissions from FCCUs are SO<sub>2</sub>, sulfur trioxide (SO<sub>3</sub>), NO<sub>2</sub>, nitric oxide (NO), and ammonia slip (NH<sub>3</sub>).

The purpose of an FCCU at a refinery is to convert or “crack” heavy oils (hydrocarbons), with the assistance of a catalyst, into gasoline and lighter petroleum products. Each FCCU consists of three main components: a reaction chamber, a catalyst regenerator and a fractionator. Heavy oil enters the reaction chamber, where it is mixed with a catalyst, typically a fine powder, under high heat. A chemical reaction occurs that converts the

heavy oil liquid into a cracked hydrocarbon vapor mixed with catalyst. The cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into lighter hydrocarbon components. Coke forms during the cracking process, so eventually, the catalyst becomes inactive or spent and is regenerated, first by removing oil residue using steam stripping. The spent catalyst is then sent to the catalyst regenerator where hot air burns the coke layer off of the surface of each catalyst particle to produce reactivated or regenerated catalyst. Subsequently, the regenerated catalyst is cycled back to the reaction chamber and mixed with more fresh heavy oil feed.

The primary source of SO<sub>2</sub> and PM<sub>2.5</sub> emissions from the catalytic cracking process is the catalyst regenerator unit. (The waste heat from the regenerator unit also provides much of the heat required by the catalytic cracking process.) During the cracking process, coke is deposited on the surface of the catalyst. The catalyst is regenerated by burning off the coke at high temperatures. The flue gas from the regenerator unit contains SO<sub>2</sub>, PM<sub>2.5</sub>, and catalyst fines (as well NO<sub>x</sub>). In addition, any organic metals in heavy gas oils can be deposited on the coke formed in the FCCU. When the coke is burned in the regenerator unit, these metals remain on the catalyst. A portion of this catalyst is emitted from the FCC as particulates containing these metal compounds.

### **2.5.2 Refinery Process Heaters and Boilers**

Refinery process heaters and boilers are a major source of SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions at most refineries. Refinery process heaters and boilers are used extensively throughout various processes in refinery operations such as distillation, hydrotreating, fluid catalytic cracking, alkylation, reforming, and delayed coking. A process heater is an enclosed device in which solid, liquid or gaseous fuels are combusted for the purpose of heating a process material (e.g., crude oil). There are two basic types of process heaters: direct and indirect. Direct-fired systems place the combustion gases in direct contact with the process material. Indirect systems rely on tubing to separate the combustion gases from the process material.

Refinery boilers generate steam that is used primarily for heating and separating hydrocarbon streams and, to a lesser extent, for producing electricity. Refinery process heaters and boilers are primarily fueled by refinery gas, one of several products generated at a refinery. In addition, most refinery process heaters and boilers are designed to also operate on natural gas. When used for heating, the steam usually heats the petroleum indirectly in heat exchangers and returns to the boiler. In direct contact operations, the steam serves as a stripping medium or a process fluid. SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions are typically created from the combustion of fuel that contains sulfur or sulfur compounds.

### **2.5.3 Sulfur Recovery Units and Tail Gas Units (SRU/TGUs)**

Because sulfur is a naturally occurring and undesirable component of crude oil, refineries employ a sulfur recovery system to maximize sulfur removal, which also generates SO<sub>2</sub> emissions. A typical sulfur removal system will include a sulfur recovery unit (e.g., Claus unit) followed by a tail gas treatment unit (e.g., amine treating) for maximum removal of hydrogen sulfide (H<sub>2</sub>S). A Claus unit consists of a reactor, catalytic converters and condensers. Two chemical reactions occur in a Claus unit. The first reaction occurs in the reactor, where a portion of H<sub>2</sub>S reacts with air to form SO<sub>2</sub>, followed by a second reaction in the catalytic converters where SO<sub>2</sub> reacts with H<sub>2</sub>S to form liquid elemental sulfur. The combination of two converters with two condensers in series will generally remove as much as 95 percent of the sulfur from the incoming acid gas.

To recover the remaining sulfur compounds after the final pass through the last condenser, the gas is sent to a tail gas treatment process such as a SCOT where the sulfur compounds in the tail gas are converted to H<sub>2</sub>S. The H<sub>2</sub>S is absorbed by a solution of amine in the H<sub>2</sub>S absorber, steam-stripped from the absorbent solution in the H<sub>2</sub>S stripper, concentrated, and recycled to the front end of the sulfur recovery unit. The residual H<sub>2</sub>S in the treated gas from the absorber is typically vented to a thermal oxidizer where it is oxidized to SO<sub>2</sub> before venting to the atmosphere.

The Wellman-Lord tail gas treatment process is a process where the sulfur compounds in the tail gas are first incinerated to SO<sub>2</sub>. After the incinerator, the tail gas enters a SO<sub>2</sub> absorber, where the SO<sub>2</sub> is absorbed in a sodium sulfite (Na<sub>2</sub>SO<sub>3</sub>) solution to form sodium bisulfite (NaHSO<sub>3</sub>) and sodium pyrosulfate (Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>). The absorbent, rich in SO<sub>2</sub>, is then stripped and the SO<sub>2</sub> is recycled back to the beginning of the Claus unit. The residual sulfur compounds in the treated tail gas from the SO<sub>2</sub> absorber are then vented to a thermal oxidizer where they are oxidized to SO<sub>2</sub> before venting to the atmosphere.

#### **2.5.4 Petroleum Coke Calciner**

Petroleum coke is processed in a delayed coker unit (described below) to generate a carbonaceous solid referred to as “green coke,” a commodity. To improve the quality of the product, if the green coke has a low metals content, it will be sent to a calciner to make calcined petroleum coke. Calcined petroleum coke can be used to make anodes for the aluminum, steel, and titanium smelting industry. If the green coke has a high metals content, it is used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined petroleum coke begins when the green coke feed from the delayed coker unit is screened and transported to the calciner unit where it is stored in a covered coke storage barn. The screened and dried green coke is introduced into the top end of a rotary kiln and is tumbled by rotation under high temperatures that range between 2,000 and 2,500 degrees Fahrenheit (°F). The rotary kiln relies on gravity to move coke through the kiln countercurrent to a hot stream of combustion air produced by the combustion of natural gas or fuel oil. As the green coke flows through the kiln, the

combustion air removes moisture, impurities, and hydrocarbons. Once discharged from the kiln, the calcined coke is dropped into a cooling chamber, where it is quenched with water, treated with de-dusting agents to minimize dust, and carried by conveyors to storage tanks. SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions are generated when the green coke is processed under high heat conditions in the rotary kiln.

### 2.5.5 Diesel Internal Combustion Engines (ICEs)

Diesel ICEs are often used to provide electricity in areas of a refinery that may not have access to electricity power lines from the local electric utility or other onsite sources of electricity, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Four-stroke cycle ICEs are more commonly used than two-stroke ICEs. Diesel ICEs operate by drawing air into a cylinder and then injecting fuel after the air has been compressed. Diesel ICEs rely on high temperature alone for ignition. Diesel ICEs are often referred to as compression ignition engines because the high temperature is the result of compressing air above the piston as it travels upward. The power output of a diesel ICE is controlled by varying the amount of fuel injected into the air, thereby, varying the fuel-air ratio. The main advantage of using a diesel engine is its high thermal efficiency<sup>1</sup>, which can exceed 50 percent. However, diesel ICE exhaust tends to be high in NO<sub>x</sub> and particulate emissions, both visible (smoke) and invisible. Diesel particulates were also classified as a TAC by CARB in 1998. Other diesel exhaust pollutants may include unburned or partially burned hydrocarbons and carbon monoxide.

### 2.5.6 Fugitive Emissions Sources

In addition to emissions from point sources (sources with exhaust emissions stacks), petroleum refineries have a large number and wide variety of fugitive emissions sources. Fugitive emissions are emissions of gases or vapors from pressurized equipment due to leaks and other unintended or irregular releases of gases during the crude refining process. Generally, any processes or transfer areas where leaks can occur are sources of fugitive VOC emissions. Fugitive emissions sources include, but are not limited to, valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, PRDs, storage tanks, etc. Because crude oil and other refinery streams contain a number of toxic contaminants including benzene, toluene, ethylbenzene, and xylene (BTEX), fugitive VOC emissions at refineries may contain these toxic compounds and, as such, pose a long term health risk to workers and local communities.

The Air District implements three levels of regulatory control requirements that apply to fugitive VOC emissions: 1) local, e.g., BAAQMD Regulation 8-18 – Equipment Leaks; 2) state, e.g., CARB’s AB2588 program; and 3) federal requirements, e.g., USEPA’s National Emission Standards for Hazardous Air Pollutants [NESHAPS], see 40 CFR Part

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<sup>1</sup> Thermal efficiency is defined as the amount of work produced by the engine divided by the amount of chemical energy in the fuel that can be released through combustion. This chemical energy is often referred to as net heating value or heat of combustion of the fuel.



61 Subpart J - National Emission Standards for Equipment Leaks (Fugitive Emission Sources) of Benzene and 40 CFR Part 61 Subpart V -National Emission Standards for Equipment Leaks (Fugitive Emission Sources)). In particular, Regulation 8-18 prohibits a person from using any equipment that leaks total organic compounds in excess of levels prescribed per type of emissions source unless the leak has been discovered by the operator, minimized and repaired within the applicable time frames established in the regulation.

Fugitive emissions sources are not typically controlled by installing air pollution control devices. Instead, fugitive emissions are reduced through leak detection and repair requirements such as those in Regulation 8-18. It may be possible, if necessary, to provide additional fugitive emissions reductions by preparing an alternate emission reduction plan consistent with Regulation 8-18, Section 405 and that includes the following, if feasible: repair pumps, compressors and connectors when leaks are less than 100 ppm; repair PRDs when leaks are less than 500 ppm; enhanced or more frequent monitoring of fugitive emissions sources, etc. Preparing and submitting an alternate emission reduction plan to the Air District would provide an enforceable mechanism to ensure that further control of fugitive emissions is being conducted at affected refineries.

Because controlling fugitive emissions does not typically involve installing air pollution control devices, adverse secondary environmental impacts would not be generated. Therefore, control of fugitive emissions sources will not be further analyzed in Chapter 3

## **2.6 APPLICABLE SO<sub>2</sub>, PM<sub>2.5</sub>, AND TAC CONTROL TECHNOLOGIES**

If an affected refinery cannot demonstrate compliance with the SO<sub>2</sub> or PM<sub>2.5</sub> NAAQS through modeling or monitoring or updating an affected refinery's HRA requires implementing risk reduction measures, the refinery operators must undertake emission or risk reduction strategies, such as reducing throughput, or install air pollution control equipment. Table 2.5-1 above shows the most likely SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC control technologies expected to be used. Each type of SO<sub>x</sub> control technology is briefly described in the following paragraphs.

### **2.6.1 Wet Gas Scrubber (WGS)**

Wet gas scrubbers are used to control both SO<sub>2</sub> and PM<sub>2.5</sub> emissions. There are two types of wet gas scrubbers: 1) caustic-based non-regenerative WGS; and, 2) regenerative WGS.

In a non-regenerative WGS, caustic soda (sodium hydroxide - NaOH) or other alkaline reagents, such as soda ash, are used as an alkaline absorbing reagent (absorbent) to capture SO<sub>2</sub> emissions. The absorbent captures SO<sub>2</sub> and sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>) and converts them to various types of sulfites and sulfates (e.g., NaHSO<sub>3</sub>, Na<sub>2</sub>SO<sub>3</sub>, and Na<sub>2</sub>SO<sub>4</sub>). The absorbed sulfites and sulfates are later separated by a purge treatment system and the treated water, free of suspended solids, is either discharged or recycled.

A regenerative WGS removes SO<sub>2</sub> from the flue gas by using a buffer solution that can be regenerated. The buffer is then sent to a regenerative plant where the SO<sub>2</sub> is extracted as concentrated SO<sub>2</sub>. The concentrated SO<sub>2</sub> is then recycled to a sulfur recovery unit. When the inlet SO<sub>2</sub> concentrations are high, a substantial amount of sulfur-based by-products can be recovered and later sold as a commodity for use in the fertilizer, chemical, pulp and paper industries. For this reason, the use of a regenerative WGS is favored over a non-regenerative WGS.

### 2.6.2 SO<sub>x</sub> Reducing Additives (SRA)

To help reduce condensable particulate matter from sulfur, SO<sub>x</sub> reducing additives (catalysts) are used for reducing the production of SO<sub>x</sub> by-products in FCCUs. A SO<sub>x</sub> reducing catalyst is a metal oxide compound such as aluminum oxide (Al<sub>2</sub>O<sub>3</sub>), magnesium oxide (MgO), vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) or a combination of the three that is added to the FCCU catalyst as it circulates throughout the reactor. In the regenerator of the FCCU, sulfur bearing coke is burned and SO<sub>2</sub>, CO, and CO<sub>2</sub> by-products are formed. A portion of SO<sub>2</sub> will react with excess oxygen and form SO<sub>3</sub>, which will either stay in the flue gas or react with the metal oxide in the SO<sub>x</sub> reducing catalyst to form a metal sulfate. In the FCCU reactor, the metal sulfate will react with hydrogen to form either metal sulfide and water, or more metal oxide. In the steam stripper section of the FCCU reactor, metal sulfide reacts with steam to form metal oxide and hydrogen sulfide. The net effect of these reactions is that the quantity of SO<sub>2</sub> in the regenerator is typically reduced between 40 to 65 percent while the quantity of H<sub>2</sub>S in the reactor is increased. Generally, the increase in H<sub>2</sub>S is handled by sulfur recovery processes located elsewhere within a refinery.

### 2.6.3 Fuel Gas Treatment (FGT)

According to a study prepared by ETS, Inc., and Nexidea (SCAQMD, 2010), using a flue gas scrubber is not cost-effective for refinery process heaters and boilers. The consultants concluded that for heaters and boilers, post-combustion emission control is often expensive due to the combination of the relatively low concentrations of SO<sub>2</sub> in flue gases and the division of the fuel gas stream among a number of heaters and boilers. Pre-combustion control, e.g., fuel gas treatment, has been found to be more suitable for the majority of situations to obtain SO<sub>2</sub> emission reductions from refinery process heaters and boilers. Therefore, the analysis of potential environmental impacts from the proposed project in Chapter 3 assumes that an affected refinery operator would likely rely on the fuel gas treatment control option in order to reduce SO<sub>2</sub> emissions from refinery process heaters and boilers instead of using a flue gas scrubber.

Refinery fuel gas, commonly used for operating refinery process heaters and boilers, is treated in various sour gas processing units such as an amine (Merox<sup>2</sup>, for example)

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<sup>2</sup> Merox is an acronym for mercaptan oxidation and the treatment process is a proprietary catalytic chemical process used for removing mercaptans from refinery fuel gas by converting them to liquid

treating unit for removal of sour components such as H<sub>2</sub>S, carbonyl sulfide (COS), mercaptan, and ammonia. Lean amine is generally used as an absorbent. At the end of the process, the lean amine is regenerated to form rich amine and H<sub>2</sub>S is recovered in an acid gas stream, which is then fed to the SRU/TGU for more processing. By improving the efficiency of the amine treating unit to recover more sulfur from the inlet sour gas stream, the sulfur content in the refinery fuel gas at the outlet and subsequently the SO<sub>2</sub> emissions from boilers and heaters that use these refinery fuel gases can be reduced.

Selective Oxidation Catalyst EmeraChem Power LLC markets a proprietary catalytic gas treatment called selective oxidation catalyst “ESx” that is typically used as a sulfur reducing agent in conjunction with its “EMx NOx trap” catalyst to treat combustion exhaust gases from incinerators, process heaters, turbines and boilers. The ESx catalyst can also be used as part of SO<sub>2</sub> reduction for sulfur recovery units/tail gas treatment units. The ESx catalyst can reduce multiple sulfur species, including SO<sub>2</sub>, SO<sub>3</sub>, and H<sub>2</sub>S from the tail gas stream while also removing CO, VOC, and PM<sub>2.5</sub> emissions. ESx catalyst is a platinum group metal catalyst that stores sulfur species and simultaneously assists in the catalytic oxidation of CO and VOCs. The ESx units are typically outfitted with multiple chambers such that at least one chamber is always in regeneration while the other units are working to store SO<sub>2</sub>. In the storage process, SO<sub>2</sub> is oxidized to SO<sub>3</sub> and is stored by EmeraChem’s sorber. The catalyst regeneration process releases sulfur as SO<sub>2</sub>.

#### **2.6.4 Baghouse**

A baghouse is an air filtration control device designed to remove particulate matter emissions from an exhaust gas stream using filter bags, cartridge-type filters, or envelope-type filters. A baghouse consists of the following components: filter medium and support, filter cleaning device, collection hopper, shell, and fan. In lieu of conventional natural or synthetic bag fabrics such as cotton or Nomex, polytetrafluoroethylene (PTFE, trade name Gore-Tex) fabric consists of a very thin laminate of microporous Teflon on a suitable substrate. PTFE bags are capable of a particulate collection efficiency of 99 to 99.9 percent for particle sizes down to 1.0 micron (µm) when properly operated and maintained. Because of the microporous nature of PTFE, air-to-cloth ratios for these applications are lower than with conventional fabrics, requiring more collector area for a given volume flow rate of gas at a higher relative pressure drop. PTFE can tolerate moderately high temperatures (400°F) at the expense of shortened bag life. The current trend in bag cleaning is the pulsejet technology, where tubular bags are supported from the inside by metal wire frames. Gas flows across the fabric from the outside inward, exiting at the top of the bags. Periodically, a blast of compressed air from a fixed nozzle located inside the wire frame causes the bag to inflate outward, thus knocking the accumulated toxics-bearing dust off the bag exterior and into the baghouse hopper, ready for collection and disposal as dry potentially hazardous solid waste.

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hydrocarbon disulfides. Merox treatment is an alkaline process that typically uses an aqueous solution of sodium hydroxide (NaOH) or caustic.

### 2.6.5 Cyclones

A cyclone, typically used as a pre-cleaner, does not have a blower mounted or connected to induce the particle-laden exhaust gas stream. Particles in the gas stream (both PM<sub>10</sub> and PM<sub>2.5</sub>) enter the cyclone tangentially and centrifugal force, which moves the particulate against the cyclone's cone wall. Air flows in a helical pattern, beginning at the top (wide end) of the cyclone and ending at the bottom (narrow) end before exiting the cyclone in a straight stream through the center of the cyclone and out the top. Larger (denser) particles in the rotating stream have too much inertia to follow the tight curve of the stream, and strike the outside wall, then fall to the bottom of the cyclone where they can be removed and sent to a storage unit. In a conical system, as the rotating flow moves towards the narrow end of the cyclone, the rotational radius of the stream is reduced, thus separating smaller and smaller particles. The cyclone geometry, together with flow rate, defines the cut point of the cyclone. Cut point is the size of particle that will be removed from the stream with a 50 percent efficiency. Particles larger than the cut point will be removed out of the airstream with a greater efficiency and smaller particles with a lower efficiency. Greater centrifugal airflow improves particle separation and increases collection efficiency. Installing a cyclone is an attractive PM<sub>2.5</sub> control option because this technology is designed specifically for harsh, industrial environments and can operate in applications with both PM<sub>10</sub> and PM<sub>2.5</sub>) particulate and high temperatures.

### 2.6.6 Electrostatic Precipitator (ESP)

An ESP is a control device designed to remove particulate matter (both PM<sub>10</sub> and PM<sub>2.5</sub>) from an exhaust gas stream. ESPs take advantage of the electrical principle that opposites attract. By imparting a high voltage charge to the particles, a high voltage direct current (DC) electrode negatively charges airborne particles in the exhaust stream, while simultaneously ionizing the carrier gas, producing an electrified field. The electric field in an ESP is the result of three contributing factors: the electrostatic component resulting from the application of a voltage in a dual electrode system, the component resulting from the space charge from the ions and free electrons, and the component resulting from the charged particulate. As the exhaust gas passes through this electrified field, the particles are charged. The strength or magnitude of the electric field is an indication of the effectiveness of an ESP. Typically 20,000 to 70,000 volts are used. The particles, either negatively or positively charged, are attracted to the ESP collecting electrode of the opposite charge.

There are two main types, dry ESPs and wet ESPs, and the decision of which type to use depends on the temperature of the exhaust gas stream when it enters the ESP, and the method used to remove particles from the collection electrodes. There are two significant advantages that most ESPs have over other control devices: 1) they have the capacity to handle large volumes of gas while minimizing the pressure drop across the unit; and 2) they generally have lower operating costs. The possible disadvantages of utilizing ESPs are potentially high capital costs and because of their size, large installation space (i.e.,

land) requirements. Dry ESPs can be designed to operate in for many different inlet stream conditions, temperatures and pressures. However, once a dry ESP is designed and installed, changes in operating conditions are likely to degrade overall performance. Wet ESPs have several advantages over dry ESPs in that they can absorb gases, cause some pollutants to condense (so that they are easier to collect), are easily integrated with other control equipment (i.e., scrubbers), eliminate the re-entrainment of captured particles, and are not limited by the resistivity of the particles.

### **2.6.7 Diesel Particulate Filters (DPFs)**

To further reduce diesel particulate matter (DPM) emissions from diesel ICEs, the ICEs could be retrofitted with DPFs. DPFs allow exhaust gases to pass through the filter medium, but trap DPM before it is released to the atmosphere. Depending on an engine's baseline emissions and emission test method or duty cycle, DPFs can achieve DPM emission reduction efficiencies from the exhaust of 70 to 90 percent. In addition, DPFs can reduce HC emissions by 95 percent and CO emissions by 90 percent. Limited test data indicate that DPFs can also reduce NO<sub>x</sub> emissions by six to ten percent.

Particulates build up in the traps over time and must be removed by burning because they are mainly carbon. Some designs use electrical resistance heaters to raise the temperature in the trap high enough to burn off the particulates. Others have a burner built into the trap. Currently, the most common regeneration scheme employs "post injection," in which a small amount of fuel is injected into the cylinder late in the expansion stroke. This fuel then burns in the exhaust system, raising the trap temperature to the point where the accumulated particulate matter is readily burned away.

There are both active DPFs and passive DPFs. Active DPFs use heat generated by means other than exhaust gases (e.g., electricity, fuel burners, and additional fuel injection to increase exhaust gas temperatures) to assist in the regeneration process. Passive DPFs, which do not require an external heat source to regenerate, incorporate a catalytic material, typically a platinum group metal, to assist in oxidizing trapped diesel PM.

### **2.6.8 Diesel Oxidation Catalysts (DOCs)**

A DOC is a device that utilizes a chemical process in order to break down pollutants from a diesel engine in the exhaust stream, turning them into less harmful components, similar to an automobile's catalytic converter. DOCs typically consist of a monolith honeycomb substrate coated with platinum group metal catalyst, such as platinum, iridium, osmium, palladium, rhodium, and ruthenium, packaged in a stainless steel container. The honeycomb structure with many small parallel channels presents a high catalytic contact area to exhaust gasses. As the hot gases contact the catalyst, several exhaust pollutants are converted into carbon dioxide and water. DOCs have a control efficiency of approximately 30 percent. DOCs also reduce emissions of HC by 76 percent and CO by 46 percent. DOCs are also effective at reducing toxic air contaminant emissions, including polycyclic aromatic hydrocarbons (PAHs), which can be reportedly reduced by

more than 80 percent. DOCs, however, increase sulfate PM emissions by oxidizing the sulfur in diesel fuel and lubricating oil, thus reducing overall catalyst effectiveness.

### **2.6.9 New Diesel Internal Combustion Equipment (ICEs)**

Diesel ICEs are often used to provide electricity in certain areas of a refinery, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Diesel ICEs are often referred to as compression ignition engines because the high temperature is the result of compressing air above the piston as it travels upward. The main advantage of using a diesel engine is its high thermal efficiency, however, diesel ICE exhaust tends to be high in NO<sub>x</sub> and particulate emissions, both visible (smoke) and invisible. Diesel particulates were also classified as a TAC by CARB in 1998. Other diesel exhaust pollutants may include unburned or partially burned hydrocarbons and carbon monoxide. Newer diesel ICEs are more efficient than older ICEs, thus, generate fewer emissions. By replacing older ICEs with newer ICEs refinery owner/operators may find additional sources in the event further emission reductions are needed to meet standards associated with the proposed project.

## **CHAPTER 3**

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### **ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES, AND CUMULATIVE IMPACTS**

Introduction

Air Quality

Greenhouse Gases

Hazards and Hazardous Materials

Hydrology and Water Quality

Growth Inducing Impacts

Significant Environmental Effects Which Cannot be Avoided

Environmental Effects Not Found to be Significant





## **3.0 ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS**

### **3.1 INTRODUCTION**

The environmental resource section is organized into the following subsections: (1) Environmental Setting; (2) Regulatory Setting; (3) Thresholds of Significance; (4) Environmental Impacts; (5) Mitigation Measures; and (6) Cumulative Impacts. A description of each subsection follows.

#### **3.1.1 ENVIRONMENTAL SETTING**

CEQA Guidelines §15125 requires that an EIR include a description of the physical environmental conditions in the vicinity of the proposed project as they exist at the time the NOP/IS is published, or if no NOP/IS is published, at the time the environmental analysis is commenced, from both a local and regional perspective. This Chapter describes the existing environment in the Bay Area as it exists at the time the NOP/IS was prepared (February 2015). The analyses included in this chapter focus on those aspects of the environmental resource areas that could be adversely affected by the implementation of the proposed revisions to District permitting regulations as determined in the NOP/IS (see Appendix A), and not those environmental resource areas determined to have no potential adverse impact from the proposed project. The NOP/IS (see Appendix A) determined the air quality, greenhouse gases, hazards and hazardous materials, and hydrology and water quality impacts associated with the proposed amendments were potentially significant and are evaluated in this EIR.

#### **3.1.2 THRESHOLDS OF SIGNIFICANCE**

This section identifies the criteria used to determine when physical changes to the environment created as a result of the proposed project approval would be considered significant. The levels of significance for each environmental resource were established by identifying significance criteria. These criteria are based upon those presented in the California Environmental Quality Act (CEQA) environmental checklist and the BAAQMD's CEQA Air Quality Handbook (BAAQMD, 1999 and 2011).

The significance determination under each impact analysis is made by comparing the proposed project impacts with the conditions in the environmental setting and comparing the difference to the significance criteria.

#### **3.1.3 ENVIRONMENTAL IMPACTS**

The potential impacts associated with each discipline are either quantitatively analyzed where possible or qualitatively analyzed where data are insufficient to quantify impacts. The impacts are compared to the significance criteria to determine the level of significance.

The impact sections of this chapter focus on those impacts that are considered potentially significant per the requirements of CEQA. An impact is considered significant if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the project fall within one of the following categories:

**Beneficial:** Impacts will have a positive effect on the resource.

**No Impact:** There would be no impact to the identified resource as a result of the project.

**Less than Significant:** Some impacts may result from the project; however, they are judged to be less than significant. 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. A "less than significant impact" applies where the environmental impact does not exceed the significance threshold.

**Potentially Significant but Mitigation Measures Can Reduce Impacts to Less Than Significant:** Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to less than significant.

**Potentially Significant or Significant Impacts:** Adverse impacts may occur that would be significant even after mitigation measures have been applied to minimize their severity. A "potentially significant or significant impacts" applies where the environmental impact exceeds the significance threshold, or information was lacking to make a finding of insignificance.

It is important to note that CEQA will also apply to individual projects at the time any permits are submitted in the future in response to Regulation 12-16 and the potential for any control equipment or other design modifications to a refinery to have secondary adverse environmental impacts will be evaluated at that time. Should projects be required, a separate project-specific CEQA analysis will be conducted at the time of permitting to ensure that any significant adverse environmental impacts are identified and mitigated, as necessary, or avoided.

#### 3.1.4 MITIGATION MEASURES

This section describes feasible mitigation measures that could minimize potentially significant or significant impacts that may result from project approval. CEQA Guidelines (§15370) defines mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

In accordance with CEQA statutes (§21081.6), a mitigation and monitoring program would be required to be adopted to demonstrate and monitor compliance with any mitigation measures identified in this EIR. The program would identify specific mitigation measures to be undertaken, when the measure would be implemented, and the agency responsible for oversight, implementation and enforcement.

### **3.1.5 CUMULATIVE IMPACTS**

CEQA Guidelines §15130(a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. An EIR evaluating the environmental impact of air quality regulations essentially evaluates the cumulative impacts associated with a variety of regulatory activities. As such, this EIR evaluates the cumulative environmental impacts associated with implementation of other air quality regulations as outlined in the 2010 Clean Air Plan, the most recent air plan for the Bay Area (BAAQMD, 2010). The area evaluated for cumulative impacts in this EIR is the area within the jurisdiction of the District, an area encompassing 5,600 square miles, which 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.

## 3.2 AIR QUALITY

The NOP/IS (see Appendix A) determined that air quality impacts of the proposed new District tracking, monitoring, and refinery emissions rules are potentially significant. Project-specific and cumulative adverse air quality impacts associated with the proposed new rules on air contaminants (including criteria air pollutants and toxic air contaminants (TACs)) of the proposed new rules have been evaluated in Chapter 3.2 of this EIR.

### 3.2.1 ENVIRONMENTAL SETTING

#### 3.2.1.1 Criteria Pollutants

##### Ambient Air Quality Standards

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, volatile organic compounds (VOC), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), PM<sub>10</sub> and PM<sub>2.5</sub>. These standards were established to protect sensitive individuals 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 3.2-1.

The BAAQMD monitored levels of various criteria pollutants at 25 monitoring stations in 2014. The 2014 air quality data from the BAAQMD monitoring stations are presented in Table 3.2-2. 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 on five days in the District in 2014, while the state 8-hour standard was exceeded on ten days. The State 1-hour ozone standard was exceeded on three days in 2014 in the District. The ozone standards are most frequently exceeded in the Eastern District (Livermore (7 days) and San Ramon (4 days)), and the Santa Clara Valley (Gilroy (4 days), and Los Gatos (3 days)) (see Table 3.2-2).

Air quality conditions in the San Francisco Bay Area have improved since the 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 (see Table 3.2-3). The District is in attainment of the State and federal ambient air quality standards for CO, NO<sub>x</sub>, and SO<sub>2</sub>. The District is not considered to be in attainment with the ozone standards and State PM<sub>10</sub> and PM<sub>2.5</sub> standards.

TABLE 3.2-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
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	0.03 ppm, annual avg.> 0.18 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.10 ppm, 1-hr 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. >	0.5 ppm, 3-hr. avg.> 0.075 ppm, 1-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 (PM <sub>10</sub> )	20 µg/m <sup>3</sup> , annual arithmetic mean > 50 µg/m <sup>3</sup> , 24-hr average>	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 (PM <sub>2.5</sub> )	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> 0.15 µg/m <sup>3</sup> , 3-mo. avg. >	(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 3.2-2  
Bay Area Air Pollution Summary – 2014**

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM <sub>10</sub>				PM <sub>2.5</sub>				
	Max 1-hr	Cal 1-hr Days	Max 8-hr	Nat 8-Hr Days	Cal 8-hr Days	3-Yr Avg	Max 1-hr	Max 8-hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat/Cal 1-hr	Max 1-hr	Max 24-hr	Nat/Cal 1-hr	Ann Avg	Max 24-hr	Nat Days	Cal Days	Max 24-hr	Nat 24-hr 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*	74	0	66	0	0	58	2.2	1.4	0	46	8	0	-	-	-	15.8	39	0	0	29.9	0	*	12.0	*
San Rafael	88	0	68	0	0	56	1.9	1.1	0	62	11	0	-	-	-	14.1	41	0	0	38.1	1	22	10.8	9.8
Sebastopol*	67	0	61	0	0	*	1.4	0.9	0	44	4	0	-	-	-	-	-	-	-	26.2	0	*	7.7	*
Vallejo	77	0	68	0	0	58	2.5	2.1	0	50	8	0	23.9	2.4	0	-	-	-	-	39.6	1	26	9.9	9.6
<b>Coast/Central Bay</b>																								
Laney College Fwy*	-	-	-	-	-	-	2.0	1.1	0	65	17	0	-	-	-	-	-	-	-	26.0	0	*	8.4	*
Oakland	83	0	68	0	0	47	2.8	1.7	0	82	12	0	-	-	-	-	-	-	-	37.6	1	24	8.5	9.4
Oakland-West*	72	0	59	0	0	47	3.0	2.6	0	56	14	0	16.5	3.3	0	-	-	-	-	38.8	1	*	9.5	*
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	19.2	5.0	0	-	-	-	-	-	-	-	-	-
San Francisco	79	0	69	0	0	47	1.6	1.2	0	84	12	0	-	-	-	17.0	36	0	0	33.2	0	23	7.7	8.6
San Pablo*	75	0	60	0	0	52	1.8	1.0	0	52	9	0	15.3	5.8	0	16.4	46	0	0	38.2	1	*	10.5	*
<b>Eastern District</b>																								
Bethel Island	92	0	71	0	1	67	0.9	0.7	0	33	5	0	10.5	3.4	0	16.7	61	0	1	-	-	-	-	-
Concord	95	1	80	2	2	64	1.4	1.1	0	48	8	0	29.1	4.5	0	14.2	43	0	0	30.6	0	22	6.6	7.0
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	25.7	5.4	0	-	-	-	-	-	-	-	-	-
Fairfield	81	0	70	0	0	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	93	0	80	4	7	72	-	-	-	49	10	0	-	-	-	-	-	-	-	42.9	1	27	7.6	7.5
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	21.2	4.6	0	-	-	-	-	-	-	-	-	-
Patterson Pass	-	-	-	-	-	-	-	-	-	21	3	0	-	-	-	-	-	-	-	-	-	-	-	-
San Ramon	86	0	77	3	4	67	-	-	-	37	6	0	-	-	-	-	-	-	-	-	-	-	-	-
<b>South Central Bay</b>																								
Hayward	96	1	75	0	4	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	86	0	65	0	0	56	3.2	1.6	0	55	11	0	-	-	-	-	-	-	-	35.0	0	23	7.1	8.8
<b>Santa Clara Valley</b>																								
Gilroy	84	0	74	0	4	66	-	-	-	-	-	-	-	-	-	-	-	-	-	25.7	0	18	6.8	7.6
Los Gatos	90	0	77	1	3	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	89	0	66	0	0	60	2.4	1.9	0	58	13	0	3.0	0.9	0	19.9	55	0	1	60.4	2	30	8.4	10.0
San Jose Freeway*	-	-	-	-	-	-	2.2	1.9	0	65	*	0	-	-	-	-	-	-	-	24.3	0	*	*	*
San Martin	97	1	78	3	5	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Days over Standard</b>		<b>3</b>		<b>5</b>	<b>10</b>				<b>0</b>			<b>0</b>			<b>0</b>			<b>0</b>	<b>2</b>		<b>3</b>			

\* PM<sub>2.5</sub> monitoring using the federally accepted method began at Napa, Oakland West, and San Pablo in December 2012. Therefore, 3-year average PM<sub>2.5</sub> statistics are not available. Air monitoring at Sebastopol began in January 2014. Therefore, 3-year average statistics for ozone and PM<sub>2.5</sub> are not available. In addition, the Sebastopol site replaced the Santa Rosa site which closed on December 13, 2013. Therefore, statistics for Santa Rosa are not provided in the 2014 summary. Near-road air monitoring at Laney College Freeway began in February 2014. Therefore, 3-year average PM<sub>2.5</sub> statistics are not available. Near-road air monitoring at San Jose Freeway began in September 2014. Therefore, annual average NO<sub>2</sub> and 3-year average PM<sub>2.5</sub> statistics are not available.

(ppb) = parts per billion (ppm) = parts per million, (µg/m<sup>3</sup>) = micrograms per cubic meter.

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TABLE 3.2-3

**Bay Area Air Quality Summary  
Days over Standards**

YEAR	OZONE			CARBON MONOXIDE				NO <sub>x</sub>		SULFUR DIOXIDE		PM <sub>10</sub>		PM <sub>2.5</sub>
	8-Hr	1-Hr	8-Hr	1-Hr		8-Hr		1-Hr		1-Hr	24-Hr	24-Hr*		24-Hr
	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat
2005	5	9	9	0	0	0	0	0	0	0	0	0	6	21
2006	17	18	22	0	0	0	0	1	0	0	0	0	15	10
2007	2	4	9	0	0	0	0	0	0	0	0	0	4	14
2008	12	9	20	0	0	0	0	0	0	2	0	0	5	12
2009	8	11	13	0	0	0	0	0	0	0	0	0	1	11
2010	9	8	00	0	0	0	0	0	0	0	0	0	2	6
2011	4	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	4	3	8	0	0	0	0	1	0	0	0	0	2	3
2013	3	3	3	0	0	0	0	0	0	0	0	0	6	13
2014	5	3	10	0	0	0	0	0	0	0	0	0	2	3

All monitoring stations were in compliance with the federal PM<sub>10</sub> standards. The California PM<sub>10</sub> standards were exceeded on two days in 2014, at the San Jose and Bethel Island monitoring stations. The Air District exceeded the federal PM<sub>2.5</sub> standard on three days, most frequently in San Jose in 2014 (see Table 3.2-2).

**3.2.1.2 Health Effects**

Ozone

Ozone (O<sub>3</sub>), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

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

The BAAQMD began ozone monitoring in a few places in 1959. A large ozone monitoring network was established in 1965. The monitoring data in Table 3.2-3 illustrates the number of days per year that the Bay Area exceeded the State and federal ozone standards through much of the first decade on the 21<sup>st</sup> century. Ozone concentrations in the BAAQMD still exceed the federal and State 8-hour ozone standards on occasion and the Bay Area is therefore designated as non-attainment for the State 8-hour ozone standard.

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

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

### Volatile Organic Compounds (VOCs)

It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because VOC emissions contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM<sub>10</sub> and lower visibility levels.

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

VOC emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to VOC emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide VOC sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions.

### Carbon Monoxide (CO)

CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. In 1997, 97 percent of the CO emitted into the



District's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

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

When CO is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic effect after exposure to CO and ozone.

#### Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>)

Of serious concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM<sub>10</sub> and PM<sub>2.5</sub>.

A consistent correlation between elevated ambient fine particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM<sub>2.5</sub>) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

PM<sub>10</sub> particles are both directly emitted or formed from diverse emission sources. Major sources of directly emitted (primary) PM<sub>10</sub> include re-suspended road dust or soil entrained into the atmosphere by wind or activities such as construction and agriculture. Other components of PM<sub>10</sub> form in the atmosphere (secondary PM<sub>10</sub>) from precursor emissions of the gaseous pollutants.

### Nitrogen Dioxide (NO<sub>2</sub>)

NO<sub>2</sub> is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N<sub>2</sub>) and oxygen (O<sub>2</sub>) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO<sub>2</sub>. NO<sub>2</sub> is responsible for the brownish tinge of polluted air. The two gases, NO and NO<sub>2</sub>, are referred to collectively as nitrogen oxides or NO<sub>x</sub>. In the presence of sunlight, NO<sub>2</sub> reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO<sub>3</sub>) which reacts further to form nitrates, which are a component of PM<sub>10</sub>.

NO<sub>2</sub> is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

### Sulfur Dioxide (SO<sub>2</sub>)

SO<sub>2</sub> is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), which contributes to acid precipitation, and sulfates, which are a component of PM<sub>10</sub> and PM<sub>2.5</sub>. Most of the SO<sub>2</sub> emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO<sub>2</sub> affects breathing and the lungs' defenses, and can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. SO<sub>2</sub> also causes plant damage, damage to materials, and acidification of lakes and streams.

## **3.2.1.3 Current Emissions Sources**

The two broad categories of emission sources include stationary and mobile sources.

### **3.2.1.3.1 Stationary Sources**

Stationary sources can be further divided between point and area sources.

**Point Sources:** Point sources are those that are identified on an individual facility or source basis, such as refineries and manufacturing plants. BAAQMD maintains a computer data bank with detailed information on operations and emissions characteristics for nearly 4,000 facilities, with roughly 20,000 different sources, throughout the Bay Area.

**Area Sources:** Area sources are stationary sources that are individually very small, but that collectively make a large contribution to the inventory. Many area sources do not require permits from the BAAQMD, such as residential heating, and the wide range of consumer products such as paints, solvents, and cleaners. Some facilities considered to

be area sources do require permits from the BAAQMD, such as gas stations and dry cleaners.

#### 3.2.1.3.2 Mobile Sources

Mobile sources include on-road motor vehicles such as automobiles, trucks, and buses, as well as off-road sources such as construction equipment, boats, trains, and aircraft. Estimates of on-road motor vehicle emissions include consideration of the fleet mix (vehicle type, model year, and accumulated mileage), miles traveled, ambient temperatures, vehicle speeds, and vehicle emission factors, as developed from comprehensive CARB testing programs.

#### 3.2.1.4 Non-Criteria Pollutants

Although the primary mandate of the BAAQMD is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the BAAQMD jurisdiction, the BAAQMD also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. TACs can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute effects such as eye watering, respiratory irritation, running nose, throat pain, and headaches. TACs are separated into carcinogens and non-carcinogens based on the nature of the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Non-carcinogenic substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is expected to occur. The state and federal governments have set health-based ambient air quality standards for criteria pollutants. These levels are determined on a pollutant-by-pollutant basis. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to TACs.

The major elements of the District's air toxics program are outlined below.

- Preconstruction review of new and modified sources for potential health impacts, and the requirement for new/modified sources with TAC emissions that exceed a specified threshold to use BACT.
- The Air Toxics Hot Spots Program, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of TACs, to report significant emissions to the affected public, and to reduce unacceptable health risks.

- Control measures designed to reduce emissions from source categories of TACs, including rules originating from the state Toxic Air Contaminant Act and the federal Clean Air Act.
- The TAC emissions inventory, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.
- Ambient monitoring of TAC concentrations at a number of sites throughout the Bay Area.

#### 3.2.1.4.1 Air Toxics Emission Inventory

The BAAQMD maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed emissions inventory is reported in the BAAQMD, Toxic Air Contaminant Control Program, 2010 Annual Report (BAAQMD, 2015). The 2010 emissions inventory continues to show decreasing emissions of many TACs in the Bay Area.

#### 3.2.1.4.2 Ambient Monitoring Network

Table 3.2-4 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2010.

**TABLE 3.2-4  
Summary of BAAQMD Ambient Air Toxics Monitoring Data<sup>(1)</sup>**

Pollutant	Units	Average MDL <sup>(1)</sup>	% less than MDL	Max Sample Value	Min Sample Value	Average Sample Value <sup>(2) (3)</sup>
1,3-Butadiene	ppb	5.73E-02	87%	3.30E-01	0.00E+00	3.84E-02
Acetaldehyde	ppb	5.86E-02	0%	3.10E+00	1.97E-01	6.84E-01
Acetone	ppb	1.27E-01	1%	3.50E+01	0.00E+00	2.25E+00
Acetonitrile	ppb	2.55E-01	26%	2.34E+00	0.00E+00	5.09E-01
Antimony	µg/m <sup>3</sup>	1.50E-03	78%	5.02E-02	00.0E+00	2.36E-03
Arsenic	µg/m <sup>3</sup>	7.81E-04	92%	2.92E-03	0.00E+00	4.32E-04
Benzene	ppb	2.41E-02	1%	1.26E+00	0.00E+00	2.17E-01
Bromomethane	ppb	3.00E-02	95%	7.30E-02	1.50E-02	1.65E-02
Cadmium	µg/m <sup>3</sup>	7.81E-04	85%	1.92E-02	0.00E+00	8.67E-04
Carbon Tetrachloride	ppb	1.14E-02	0%	1.70E-01	7.00E-02	1.03E-01
Chlorine	µg/m <sup>3</sup>	0.00E+00	5%	3.64E+00	0.00E+00	3.43E-01
Chloroform	ppb	1.14E-02	46%	8.00E-02	0.00E+00	1.95E-02
Chromium	µg/m <sup>3</sup>	1.02E-03	25%	1.00E-01	0.00E+00	2.48E-03
Cis-1,3-Dichloropropylene	ppb	1.00E-01	100%	5.00E-02	5.00E-02	5.00E-02
Cobalt	µg/m <sup>3</sup>	7.81E-04	76%	3.26E-03	0.00E+00	5.25E-04

TABLE 3.2-4 (Concluded)

Pollutant <sup>(4)</sup>	Units	Average MDL <sup>(2)</sup>	% less than MDL	Max Sample Value	Min Sample Value	Average Sample Value <sup>(1)(3)</sup>
Copper	µg/m <sup>3</sup>	4.00E-04	31%	4.90E-02	0.00E+00	5.74E-03
Dichloromethane	ppb	1.00E-01	37%	4.40E+00	0.00E+00	1.80E-01
Ethyl Alcohol	ppb	3.00E-01	0%	2.27E+01	4.00E+00	1.16E+01
Ethylbenzene	ppb	6.18E-02	53%	1.20E+00	0.00E+00	8.25E-02
Ethylene Dibromide	ppb	1.00E-02	100%	0.00E+00	0.00E+00	5.00E-03
Ethylene Dichloride	ppb	1.00E-01	100%	0.00E+00	0.00E+00	5.00E-02
Formaldehyde	ppb	6.76E-02	0%	6.30E+00	2.00E-01	1.46E+00
Lead	µg/m <sup>3</sup>	7.81E-04	40%	2.40E-01	0.00E+00	4.85E-03
M/P Xylene	ppb	6.18E-02	9%	5.27E+00	0.00E+00	3.18E-01
Magnesium	µg/m <sup>3</sup>	0.00E+00	36%	4.88E-01	0.00E+00	5.54E-02
Manganese	µg/m <sup>3</sup>	7.81E-04	25%	2.00E-01	0.00E+00	7.06E-03
Mercury	µg/m <sup>3</sup>	0.00E+00	98%	1.70E-03	0.00E+00	2.24E-05
Methyl Chloroform	ppb	2.73E-02	88%	4.30E+00	0.00E+00	3.22E-02
Methyl Ethyl Ketone	ppb	1.00E-01	28%	1.78E+00	0.00E+00	1.89E-01
Nickel	µg/m <sup>3</sup>	4.50E-03	57%	6.00E-02	0.00E+00	3.39E-03
O-Xylene	Ppb	4.82E-02	30%	5.12E+00	0.00E+00	1.21E-01
PAHs <sup>(4)</sup>	ng/m <sup>3</sup>					1.90E-01
Selenium	µg/m <sup>3</sup>	7.81E-04	76%	8.60E-03	0.00E+00	8.04E-04
Styrene	ppb	1.00E-01	96%	1.20E-01	5.00E-02	5.22E-02
Sulfur	µg/m <sup>3</sup>	0.00E+00	0%	1.73E+00	3.74E-02	3.56E-01
Tetrachloroethylene	ppb	5.68E-03	21%	2.80E-01	0.00E+00	1.88E-02
Toluene	ppb	6.18E-02	2%	4.33E+00	0.00E+00	6.22E-01
Trans-1,3-Dichloropropylene	ppb	1.00E-01	100%	5.00E-02	5.00E-02	5.00E-02
Trichloroethylene	ppb	1.14E-02	84%	5.20E-01	0.00E+00	1.42E-02
Trichlorofluoromethane	ppb	1.00E-02	0%	6.90E-01	1.00E-02	1.96E-01
Vanadium	µg/m <sup>3</sup>	4.00E-04	72%	5.10E-03	0.00E+00	5.34E-04
Vinyl Chloride	ppb	1.00E-01	100%	0.00E+00	0.00E+00	5.00E-02
Zinc	ng/m <sup>3</sup>	1.80E-03	0%	1.90E-01	0.00E+00	1.38E-02

Source BAAQMD 2010 Toxic Air Contaminant Monitoring Data. Data are a summary of data from all monitoring stations within the District.

1. If an individual sample value was less than the MDL (Minimum Detection Limit), then 1/2 MDL was used to determine the Average Sample Value.
2. Some samples (especially metals) have individual MDLs for each sample. An average of these MDLs was used to determine 1/2 MDL for the Average Sample Value.
3. Data for these two substances was collected but not presented because the sampling procedure is not sanctioned for use by U.S. EPA or CARB.
4. For compounds with 100% of sample values less than MDL, please use caution using the assumed Average Sample Values.

### **3.2.2 EXISTING REGULATORY SETTING**

#### **3.2.2.1 Criteria Pollutants**

Bay Area refineries are subject to various air quality regulations that have been adopted by the Air District, CARB and U.S. EPA. These rules contain standards that are expressed in a variety of forms to ensure that emissions are effectively controlled including:

- Requiring the use of specific emission control strategies or equipment (e.g., the use of floating roof tanks for VOC emissions);
- Requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95 percent control of VOC emissions from pressure relief devices);
- Requiring that emissions from a source not exceed specific concentration levels (e.g., 100 parts per million (ppm) by volume of VOC for equipment leaks, unless those leaks are repaired within a specific timeframe; 250 ppm by volume SO<sub>2</sub> in exhaust gases from sulfur recovery units; 1,000 ppm by volume SO<sub>2</sub> in exhaust gases from catalytic cracking units);
- Requiring that emissions not exceed certain quantities for a given amount of material processed or fuel used at a source (e.g., 0.033 pounds NO<sub>x</sub> per million BTU of heat input, on a refinery-wide basis, for boilers, process heaters, and steam generators);
- Requiring that emissions be controlled sufficient to not result in off property air concentrations above specified levels (e.g., 0.03 ppm by volume of hydrogen sulfide (H<sub>2</sub>S) in the ambient air);
- Requiring that emissions from a source not exceed specified opacity levels based on visible emissions observations (e.g., no more than 3 minutes in any hour in which emissions are as dark or darker than No. 1 on the Ringelmann chart); and
- Requiring that emissions be minimized by the use of all feasible prevention measures (e.g., flaring prohibited unless it is in accordance with an approved Flare Minimization Plan).

Air quality rules generally do not expressly limit mass emissions (e.g., pounds per year of any particular regulated air pollutant) from affected equipment unless that equipment was constructed or modified after March 7, 1979 and subject to the Air District's New Source Review (NSR) rule. All Bay Area refineries have "grandfathered" emission sources that were not subject to NSR but are generally regulated by equipment specific Air District regulations. As a result, none of these facilities have overall mass emission limits that apply to the entire refinery. Nonetheless, mass emissions of relevant regulated air pollutants from Bay Area refineries are closely monitored, and these mass emissions have generally been substantially reduced over the past several decades.

Air pollutant emissions from Bay Area petroleum refineries have been regulated for over 50 years, with most of the rules and regulations being adopted following enactment of the

1970 Clean Air Act amendments. The Air District has the primary responsibility to regulate “stationary sources” of air pollution in the Bay Area, and the Air District has adopted many rules and regulations that apply to petroleum refineries.

The Air District is considering revisions to several rules and the development of new rules that may affect refinery operations. In addition to proposed Rules 12-15 and 12-16, potential revisions to the following existing rules may affect refinery operations:

- Regulation 1: General Provisions & Definitions;
- Regulation 2, Rule 1: Permits, General Requirements;
- Regulation 2, Rule 2: New Source Review, including GHG evaluation;
- Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants;
- Regulation 6, Rule 1: Particulate Matter General Requirements;
- Regulation 8, Rule 18: Equipment Leaks;
- Regulation 9, Rule 1: Sulfur Dioxide; and
- Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines.
- Regulation 11, Rule 10: Cooling Towers;

New rules that are being considered that may affect refinery operations, in addition to those proposed in draft Rules 12-15 and 12-16, are:

- Regulation 6, Rule 5: Particulate Emissions from Refinery; Fluidized Catalytic Cracking Units (FCCUs);
- Regulation 9, Rule 14: Petroleum Coke Calcining Operations;
- Rule addressing risk from Stationary Back-up Diesel Generators;

### **3.2.2.2 Toxic Air Contaminants**

The Air District uses three approaches to reduce TAC emissions and to reduce the health impacts resulting from TAC emissions: 1) Specific rules and regulations; 2) Pre-construction review; and, 3) the Air Toxics Hot Spots Program.

#### **3.2.2.2.1 Rules and Regulations**

Many of the TACs emitted by petroleum refineries are also criteria pollutants. For example, benzene and formaldehyde are precursor organic compounds, while arsenic and cadmium can be found in particulate matter. Thus, many regulations that reduce criteria pollutant emissions from refineries will also have a co-benefit of reducing toxic air contaminant emissions. In addition, the Air District implements U.S. EPA, CARB, and Air District rules that specifically target toxic air contaminant emissions from sources at petroleum refineries.

#### **3.2.2.2.2 Preconstruction Review**

The Air District’s Regulation 2, Rule 5 is a preconstruction review requirement for new and modified sources of TACs implemented through the Air District’s permitting process. This rule includes health impact thresholds, which require the use of the best available control technology for TAC emissions (TBACT) for new or modified equipment, and health risk limits cannot be exceeded for any proposed project.

**3.2.2.2.3 Air Toxics Hot Spots Program**

The Air Toxic Hot Spots program, or AB2588 Program, is a statewide program implemented by each individual air district pursuant to the Air Toxic Hot Spots Act of 1987 (Health and Safety Code Section 44300 et. seq.). The Air District uses standardized procedures to identify health impacts resulting from industrial and commercial facilities and encourage risk reductions at these facilities. Health impacts are expressed in terms of cancer risk and non-cancer hazard index.

Under this program, the Air District uses a prioritization process to identify facilities that warrant further review. This prioritization process uses toxic emissions data, health effects values for TACs, and Air District approved calculation procedures to determine a cancer risk prioritization score and a non-cancer prioritization score for each site. The District updates the prioritization scores annually based on the most recent toxic emissions inventory data for the facility. Facilities that have a cancer risk prioritization score greater than 10 or a non-cancer prioritization greater than 1 must undergo further review. If emission inventory refinements and other screening procedures indicate that prioritizations scores remain above the thresholds, the Air District will require that the facility perform a comprehensive site-wide HRA.

An Air Toxic Hot Spots Act HRA estimates the health impacts from a site due to stationary source emissions. Hot Spots Act HRAs must be conducted in accordance with statewide HRA Guidelines adopted by OEHHA that include health effects values for each TAC and establish the procedures to follow for modeling TAC transport, calculating public exposure, and estimating the resulting health impacts. OEHHA periodically reviews and updates these HRA Guidelines through a scientific review panel and public comment process. The HRA Guidelines were approved in 2003, but OEHHA proposed major revisions to these HRA Guidelines in June 2014. These proposed HRA Guidelines were adopted in March 2015.

In 1990, the Air District Board of Directors adopted the current risk management thresholds pursuant to the Air Toxic “Hot Spots” Act of 1987. These risk management thresholds, which are summarized in Table 3.2-5 below, set health impact levels that require sites to take further action, such as conducting periodic public notifications about the site’s health impacts and implementing mandatory risk reduction measures.

**TABLE 3.2-5**

**Summary of Bay Area Air Toxics Hot Spots Program Risk Management Thresholds**



Requirement	Site Wide Cancer Risk	Site Wide Non-Cancer Hazard Index
Public Notification	Greater than 10 in one million	Greater than 1
Mandatory Risk Reduction	Greater than 100 in one million	Greater than 10

### 3.2.2.3 Accidental Release Regulation

Petroleum refineries are also subject to regulatory programs that are intended to prevent accidental releases of substances. The primary programs of this type are based on requirements in the 1990 Clean Air Act amendments as follows: (1) the Process Safety Management (PSM) program, which focuses on protecting workers, and which is administered by the U.S. Occupational Safety & Health Administration (OSHA), and (2) the Accidental Release Prevention program (commonly referred to as the Risk Management Program, or RMP), which focuses on protecting the public and the environment, and which is administered by U.S. EPA. Bay Area refineries are subject to Cal/OSHA's PSM program, which is very similar to the federal OSHA program, but with certain more stringent State provisions. Bay Area refineries are subject to the California Accidental Release Prevention (CalARP) Program, which is very similar to U.S. EPA's RMP program, but with certain more stringent State provisions. In addition, Contra Costa County and the City of Richmond have both adopted an Industrial Safety Ordinance (ISO). These ISO's are very similar to CalARP requirements, but with certain more stringent local provisions. Accidental release prevention programs in California are implemented and enforced by local Administering Agencies, which in the case of the Bay Area refineries are Solano County (for the Valero Refining Company) and Contra Costa County (for the four other Bay Area refineries).

A partial list of the air pollution rules and regulations that the Air District implements and enforces at Bay Area refineries follows:

- Air District Regulation 1: General Provisions and Definitions
- Air District Regulation 2, Rule 1: Permits, General Requirements
- Air District Regulation 2, Rule 2: New Source Review
- Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants
- Air District Regulation 2, Rule 6: Major Facility Review (Title V)
- Air District Regulation 6, Rule 1: Particulate Matter, General Requirements
- Air District Regulation 8, Rule 5: Storage of Organic Liquids
- Air District Regulation 8, Rule 6: Terminals and Bulk Plants
- Air District Regulation 8, Rule 8: Wastewater (Oil-Water) Separators
- Air District Regulation 8, Rule 9: Vacuum Producing Systems
- Air District Regulation 8, Rule 10: Process Vessel Depressurization

- Air District Regulation 8, Rule 18: Equipment Leaks
- Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Air District Regulation 8, Rule 44: Marine Vessel Loading Terminals
- Air District Regulation 9, Rule 1: Sulfur Dioxide
- Air District Regulation 9, Rule 2: Hydrogen Sulfide
- Air District Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines
- Air District Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines
- Air District Regulation 9, Rule 10: Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries
- Air District Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries
- Air District Regulation 12, Rule 12: Flares at Petroleum Refineries
- 40 CFR Part 63, Subpart CC: Petroleum Refineries (NESHAP)
- 40 CFR Part 63, Subpart UUU: Petroleum Refineries: Catalytic Cracking, Catalytic Reforming, and Sulfur Plant Units (NESHAP)
- 40 CFR Part 61, Subpart FF: Benzene Waste Operations (NESHAP)
- 40 CFR Part 60, Subpart J: Standards of Performance for Petroleum Refineries (NSPS)
- State Airborne Toxic Control Measure for Stationary Compression Ignition (Diesel) Engines (ATCM)

**3.2.3 THRESHOLDS OF SIGNIFICANCE**

**3.2.3.1 Construction Emissions**

Regarding construction emissions, the Air District’s 1999 Thresholds of Significance did not identify specific significance thresholds for construction emissions. Rather the analysis required that certain control measures be implemented and, if implemented, the air pollutant impacts would be less than significant. The construction emissions identified in the 2011 CEQA Guidelines would be more conservative as they provide a specific threshold number above which impacts would be considered significant (see Table 3.2-6). Therefore, the 2011 CEQA Guidelines will be used in the current air quality analysis for construction emissions.

**TABLE 3.2-6**

**Thresholds of Significance for Construction-Related  
Criteria Air Pollutants and Precursors**

<b>Pollutant/Precursor</b>	<b>Daily Average Emissions (lbs/day)</b>
ROG	54
NOx	54

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PM <sub>10</sub>	82*
PM <sub>2.5</sub>	54*
PM <sub>10</sub> / PM <sub>2.5</sub> Fugitive Dust	Best Management Practices

\* Applies to construction exhaust emissions only.

Source: BAAQMD, 2011

#### 3.2.3.2 Operational Emissions

The District's CEQA Guidelines have been developed to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. The District first developed CEQA guidelines, which included significance thresholds for use by lead agencies, in 1999 (BAAQMD, 1999). On June 2, 2010, the Bay Area Air Quality Management District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under the California Environmental Quality Act. These Thresholds are designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on the Air District's website and included in the Air District's updated CEQA Guidelines (BAAQMD, 2011).

On March 5, 2012 the Alameda County Superior Court issued a judgment finding that the Air District had failed to comply with CEQA when it adopted the Thresholds. The court did not determine whether the Thresholds were valid on the merits, but found that the adoption of the Thresholds was a project under CEQA. The court issued a writ of mandate ordering the District to set aside the Thresholds and cease dissemination of them until the Air District had complied with CEQA. The Air District has appealed the Alameda County Superior Court's decision. The Court of Appeal of the State of California, First Appellate District, reversed the trial court's decision. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review, and the matter is currently pending at the Supreme Court.

In view of the trial court's order which remains in place pending final resolution of the case, the Air District is no longer recommending that the Thresholds be used as a generally applicable measure of a project's significant air quality impacts. Lead agencies will need to determine appropriate air quality thresholds of significance based on substantial evidence in the record. Although lead agencies may rely on the Air District's updated CEQA Guidelines for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures, the Air District has been ordered to set aside the Thresholds and is no longer recommending that these Thresholds be used as a general measure of project's significant air quality impacts. Lead agencies may continue to rely on the Air District's 1999 Thresholds of Significance and they may continue to make determinations regarding the significance of an individual project's air quality impacts based on the substantial evidence in the record for that project.

In light of the court's order, the significance threshold for the current EIR could be the significance thresholds developed in 1999. These "original" significance thresholds

limited emissions for project operations to 15 tons per year or 80 pounds per day of reactive organic gases (ROG), NO<sub>x</sub> and PM<sub>10</sub>.

Alternatively, the revised 2011 CEQA Guidelines could also be used. The revised CEQA Guidelines (BAAQMD, 2011) established thresholds for regional plans as well as project-specific thresholds (e.g., 10 tons per year of ROG, NO<sub>x</sub>, and PM<sub>2.5</sub>). The significance threshold for regional plans developed in the 2011 CEQA Guidelines was “no net increase in emissions of GHG’s, criteria air pollutants and precursors, and toxic air contaminants.”

The proposed new Regulation 12, Rules 15 and 16 would implement requirements which more closely resemble air quality plans, than specific projects. The CEQA Thresholds for air quality plans developed in 2011 are more conservative than project-specific CEQA Thresholds, as the significance threshold is zero, i.e., any increase in emissions would be considered significant. Therefore, in order to provide a conservative air quality analysis, the thresholds recommended in the revised 2011 CEQA Guidelines (BAAQMD, 2011) will be used in the current air quality impacts analysis.

### **3.2.4 ENVIRONMENTAL IMPACTS**

Chapter 2 provides a summary of the main components of Regulation 12-15, which include establishing requirements to enhance tracking of refinery emissions and crude composition, as well as requiring updating HRAs. Once data are collected, Regulation 12-15 does not impose any air pollution control requirements. CEQA recognizes that regulatory requirements consisting of data collection or information gathering, for example, do not typically generate environmental impacts (see for example, CEQA Guidelines §15306). Regulation 12-15 has been thoroughly evaluated and it has been concluded that, with one exception as explained in Subsection 3.2.4.1, it has no potential to generate any other potentially significant adverse environmental impacts and, therefore, will not be evaluated further in the remaining environmental impact discussions.

Regulation 12-16, however, would require refineries to demonstrate compliance with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub> and, if they could not do so, would require refinery operators to address excessive emissions. Similarly, if an updated HRA shows that refinery-wide cancer or non-cancer health risks exceed any of the proposed significant risk levels (action levels), risk reduction measures would be required. It is currently unknown whether or not any of the five affected refineries would be required to implement emission reduction projects under 12-16. Chapter 2 identifies types of refinery equipment that tend to be the largest sources of emissions subject to Regulation 12-16 that have the greatest potential to contribute to exceedances of the refinery-wide emissions limits for SO<sub>2</sub> and PM<sub>2.5</sub> emissions or the cancer or non-cancer significant risk levels. Chapter 2 also identifies air pollution control technologies that would most likely to be installed on the refinery equipment that may require future emissions control. As indicated in Chapter 2, some control technologies have the potential to reduce some or all pollutants regulated pursuant to Regulation 12-16. The analysis of potential secondary

adverse environmental impacts from control equipment identified in Chapter 2 that may be installed as a result of implementing Regulation 12-16 have been further analyzed in the subsections below.

It is expected that the direct effect of the proposed project would be reductions in the regulated pollutants. However, emissions from construction equipment and activities to install air pollution control equipment would generate criteria pollutant emissions. Further, air pollution control equipment that reduces one or more regulated pollutants has the potential to generate adverse secondary air quality impacts from other sources such as mobile sources or from the air pollution control equipment. For example some types of air pollution control equipment that use caustic as part of the control process, have the potential to generate emissions of the caustic material that may be considered a TAC. Construction and operation air quality impacts are identified and provided in the following subsections.

#### **3.2.4.1 Potential Criteria Pollutant Impacts During Construction**

It is not currently known whether any affected refineries would exceed the refinery-wide emissions limits for SO<sub>2</sub> and PM<sub>2.5</sub> or significant risk levels for cancer and non-cancer health effects. However, to provide a conservative analysis of potential construction air quality impacts, it is assumed that one or more of the control technologies identified in Table 2.5-1 would be installed. Construction activities associated with installing air pollution control technologies would result in VOC, NO<sub>x</sub>, SO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and GHG emissions. A range of construction scenarios for installing various types of control equipment were identified in order to determine whether or not construction air quality impacts would exceed any applicable air quality significance thresholds. The following subsections identify construction scenarios that may occur for several control technologies and are considered to be a representative range of construction activities and equipment from installing air pollution control technologies with minor construction required (few construction equipment or activities) to installation of air pollution control technologies requiring major construction (a large construction crew and a large number of construction equipment and activities).

##### **3.2.4.1.1 Installing Air Monitors**

In addition to requiring: enhanced emissions inventory information; updated HRAs; collecting and analyzing crude slate information; and collecting energy efficiency information, Regulation 12-15 would require increased TAC monitoring activities at refinery fence lines and in nearby communities. Installation of air monitors has the potential to require some construction, but construction activities would be minimal and would not contribute to significant adverse construction air quality impacts as explained in the following paragraph.

It is expected that fence line air samplers would be similar to samplers such as the Xontek Model 924 Toxic Air Sampler, which is designed for unattended field use to

collect ambient air samples for laboratory analysis of toxic compounds. The sampler is modular in design for ease of assembly, installation, operation and service. The air sampler typically consists of a control unit, pump box assembly, rain shield, sampling head mount and has a temperature-controlled heater and fans for cold or hot weather operation. For onsite fence line monitoring this type of air sampler is simply secured in place, typically using hand tools, and needs no other construction equipment or activities except for one medium-duty truck to deliver the necessary number of monitors. For community monitoring, depending on the location, some minor construction may be necessary to build fences or other types of structures for security purposes. In this situation construction would likely require, one medium-duty truck to deliver monitors, a construction crew of three workers, a post hole digger, forklift, and hand tools. Based on this scenario, installation of air monitors would result in less than significant construction emissions.

#### 3.2.4.1.2 Installing New Diesel Internal Combustion Engines (ICEs)

Diesel ICEs are often used to provide electricity in certain areas of a refinery, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Over the past several decades, emission limits for diesel ICEs have been established and modified. Initial emission limits for ICEs were for engines referred to as Tier 1 ICEs. ICEs compliant with current emission limits are known as Tier 4 ICEs. Tier 4 ICEs are more efficient than Tier 1 ICEs and emit less pollutants.

Construction emissions associated with installing new ICEs would be minor and would involve the transport of the new ICE to the refinery and the removal of the existing ICE from the refinery which is expected to require two truck trips. Installation of the ICEs would be expected to be limited to one to two workers and would not require any major equipment. Therefore installation of new diesel ICEs would result in less than significant construction emissions.

#### 3.2.4.1.3 Installing a Wet Gas Scrubber

Evaluation of the various construction scenarios related to installing air pollution control equipment concluded that installing a WGS would require more demolition and construction equipment and activities than installing other types of control technologies and, therefore, would provide a “worst-case” analysis. Because of its large size, it is expected that installing a WGS would occur over an 18-month period; one month to demolish any nearby existing equipment or structures and 17 months to construct the WGS, which would include: site preparation, assembly and installation of the unit and ancillary support equipment, and tying-in the new WGS to the affected equipment.

Depending on the size and types of equipment or structures that may need to be demolished, a worst-case assumption is that up to 50 construction workers would be required. Demolition activities are assumed to require the use of one or more of the following equipment: crane, front-end loader, forklift, demolition hammer, water truck,

and medium-duty flatbed truck. Other sources of demolition emissions could include haul truck trips to dispose of demolition debris, on-site travel (would include fugitive dust associated with travel on paved roads, and fugitive dust associated with demolition activities).

Because of its large size, construction of each WGS would likely require as many as 175 construction workers and, using worst-case assumptions, it is assumed that constructing a WGS would require the use of one or more of the following types of construction equipment: backhoes, cranes, man lifts, forklift, front end loaders generators, diesel welding machines, jack hammers, a medium-duty flatbed truck, a medium-duty dump truck, and a cement mixer. Other sources of construction emissions could include: equipment delivery, on-site travel (would include fugitive dust associated with travel on paved roads, and fugitive dust associated with construction activities).

Depending on the size and number of buildings or equipment that might need to be demolished in order to install one WGS, it is likely that demolition emissions would exceed the applicable construction air quality significance thresholds. Similarly, because actual construction of the WGS would require more construction workers and equipment than demolition, it is likely that construction emissions would also exceed the applicable construction air quality significance thresholds and, therefore, is concluded to be significant.

#### 3.2.4.1.4 Conclusion

As demonstrated in the subsections above, construction and installation of some types of air pollution control technologies would not necessarily be expected to result in significant adverse construction air quality impacts. Installation of two or more relatively small air pollution control technologies concurrently could generate significant adverse construction air quality impacts. Similarly, demolition and construction air quality impacts from installing a large-scale air pollution control unit, a single WGS for example would likely exceed the applicable construction air quality significance thresholds. Therefore, construction air quality impacts from the proposed project are concluded to be significant and mitigation measures are required.

#### **3.2.4.2 Potential Criteria Pollutant Impacts During Operation**

The net effect of implementing the proposed project, Regulation 2-16 in particular, is expected to be reductions in SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions, providing a beneficial air quality impact. However, some control technologies have the potential to generate secondary or indirect air quality impacts as part of the control process. Table 3.2-7 lists all of the air pollution control technologies that may be used to comply with future Regulation 12-16 requirements, as well as potential secondary or indirect operational air quality impacts associated with each air pollution control technology. Those air pollution control technologies in Table 3.2-7 where no direct or indirect air quality impacts were identified are not discussed further in the following subsections. The subsections below

further discuss those air pollution control technologies identified in Table 3.2-7 that have the potential to generate adverse direct or indirect operational air quality impacts.

**TABLE 3.2-7**

**Potential Operational Air Quality Impacts from Installing Air Pollution Control Equipment**

Potential Control Technology	Air Quality Impacts	Significant?
Baghouse	None identified	No
Compressor	Minor VOC Impact, overall VOC reduction	No
Cyclone	None identified	No
Diesel Oxidation Catalyst	None identified	No
Diesel Particulate Filter	Slight NO <sub>2</sub> increase from regenerating filter, but overall NO <sub>2</sub> reduction	No
Electrostatic Precipitator (Wet and Dry)	None identified	No
Fuel Gas Treatment (Additive to Existing Amine System)	Slight increase in TAC (caustic) emissions	No
Fuel Gas Treatment (Mercox)	Slight increase in TAC (caustic) emissions	No
Selective Oxidation Catalyst	None identified	No
SO <sub>x</sub> Reducing Additive	None identified	No
New Diesel ICEs	None identified	No
Wet Gas Scrubber	Minor indirect mobile source emission increases	No
Wet Gas Scrubber	Slight increase in TAC	No

The following analyses of potential operational air quality impacts from the proposed project include the following assumption; it is assumed that no additional employees would be needed to operate any new or modified air pollution control equipment, so the existing work force at each affected refinery is expected to be sufficient. As such, no workers' travel emissions are anticipated for the operation of the new or modified air pollution control equipment.

3.2.4.2.1 New Diesel ICEs

Diesel ICEs are often used to provide electricity in certain areas of a refinery, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Over the past several decades, emission limits for diesel ICEs have been established and modified. Initial emission limits for ICEs were for engines referred to as Tier 1 ICEs. ICEs compliant with current emission limits are known as Tier 4 ICEs. Tier 4 ICEs are more efficient than Tier 1 ICEs and emit less pollutants. Refineries could reduce criteria pollutants, as well as, diesel particulate matter (a TAC) by replacing older ICEs (e.g., Tier 1) with new Tier 4 ICEs.



Table 3.2-8 shows the estimated emission reductions associated with the use of Tier 4 engines as compared to Tier 1 engines.

**Table 3.2-8**

**Emission Reductions Associated with New Diesel ICEs  
Pounds per Horsepower-Hour<sup>(1)</sup>**

<b>Engine Tier</b>	<b>CO</b>	<b>VOC</b>	<b>NOx</b>	<b>PM</b>
<b>175-750 Hp Diesel ICE</b>				
Tier 1	8.5	1	6.9	0.4
Tier 4	2.6	0.14	0.3	0.015
Reduction	69%	86%	96%	96%
<b>750+ Hp Diesel ICE</b>				
Tier 1	8.5	1	6.9	0.4
Tier 4	2.6	0.14	0.5	0.022
Reduction	69%	86%	93%	95%

(1) Based on 40 CFR Part 89 and 1039

Based on the above information and depending on the engine size, replacing older existing diesel ICEs with newer diesel ICEs, would result in an estimated reduction of 69 percent of CO, 86 percent reduction in VOC, 93-96 percent reduction in NOx, and 95-96 percent reduction in PM. Therefore, replacing existing diesel ICEs with new diesel ICEs is not expected to generate significant adverse operational air quality impacts.

#### 3.2.4.2.2 Impacts from Diesel Particulate Filters

Use of DPFs may result in a slight increase in directly emitted NO<sub>x</sub> during the regeneration of passive DPFs. In response to this undesirable effect, DPF manufacturers have improved their efforts to overcome increased NO<sub>x</sub> production by using other catalytic formulations or lowering the precious metal content of the traps. One DPF manufacturer has recently developed an improved DPF system capable of reducing PM emissions by at least 85 percent while also limiting NO<sub>x</sub> emissions to 25 percent compared to NO<sub>x</sub> emissions without a DPF. Limited test data for newer designs indicate that DPFs can reduce NO<sub>x</sub> emissions by six to ten percent, so overall there may be a small, but less than significant increase in NO<sub>x</sub> emissions and with some models there may be a net reduction in NO<sub>x</sub> emissions from operation of the filter. Therefore, DPFs are not expected to generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

#### 3.2.4.2.3 Wet Gas Scrubbers

The primary air quality effect of installing WGS is a reduction in SO<sub>2</sub> emissions, providing a beneficial air quality impact. But indirect emission impacts could occur from haul trucks associated with delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis. For example, catalyst and caustic solutions are typically used in relatively small amounts per day. Depending on the size and configuration of the WGS, sodium hydroxide (NaOH) caustic solution used in the WGS would likely need to be delivered one time per week or a little over 50 additional delivery truck trips per year. This use of NaOH caustic in a WGS would most likely occur at refineries that already use and store NaOH caustic for other purposes. Otherwise, the refinery operator would need to construct a new NaOH caustic storage tank and ancillary piping and other associated equipment. Since Regulation 12-16 does not specify what SO<sub>x</sub> emission sources would need to be controlled, it is assumed for this analysis that a WGS would be built that could be supplied by the same type of caustic solution that is already used onsite for other purposes.

Because haul truck trips transporting caustic would occur relatively infrequently and it is not likely that all affected refineries would reduce SO<sub>2</sub> emissions using a WGS, a single haul truck's emissions carrying caustic from San Jose to Benicia<sup>1</sup>, for example, would be very low, a few pounds per day at most. Even if every affected refinery transported caustic on the same day, indirect mobile source emissions from transporting caustic would be low and would not be expected to exceed any applicable operational air quality significance thresholds. Therefore, truck trip emissions from transporting caustic to affected refineries that install a WGS would not generate significant adverse operational

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<sup>1</sup> Review of caustic suppliers located a chemical supplier in San Jose. The haul truck trip from San Jose to the Valero Refining Company in Benicia would likely represent a conservative trip length assumption because trip lengths to all other affected facilities would be shorter.

air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies

### **3.2.4.3 Potential Toxic Air Contaminant Impacts**

#### **3.2.4.3.1 Wet Gas Scrubbers**

Some SO<sub>2</sub> control equipment that may be installed in the future to comply with Regulation 12-16 has the potential to emit toxic air contaminants. For example, caustic is used in the operation of a WGS. It is assumed for this analysis that refineries already using caustic would install a WGS that uses the same type of caustic that is already in use at the refinery. Otherwise, a new storage tank with ancillary piping and equipment would need to be constructed.

There are several types of caustic solutions that can be used in WGS operations, but NaOH (50 percent solution, by weight) is the most commonly used. NaOH is a TAC that is a non-cancerous, but an acutely hazardous substance. NaOH emissions typically occur as a result of filling loss and the working loss of each NaOH tank, resulting in relatively low NaOH emissions. Because it is assumed that refinery operators would opt to use the same type of caustic that they are currently using for other purposes, there would likely be a small incremental increase in risk because of the increased throughput of caustic through the existing storage tanks. However, because NaOH is used in small quantities, the combined filling loss and working loss would be very small. In addition, any NaOH storage tanks would likely be located in the interior areas of a refinery, so the distance to the nearest sensitive individual would likely be far enough away that substantial dispersion of any NaOH emission would occur. For these reasons, it is unlikely that NaOH emissions would create significant adverse acute hazard impacts to any nearby sensitive individuals.

A likely caustic alternative to NaOH would be sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>) which is commonly known as soda ash, a non-toxic, non-cancerous, and nonhazardous substance. This caustic does not have the potential to generate significant adverse TAC emission impacts.

#### **3.2.4.4 Conclusion**

Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions from affected refineries if required pursuant to Regulation 12-16, direct or indirect operational air quality impacts from the proposed project are not expected to exceed the applicable operational air quality significance thresholds. Therefore, mitigation measures to reduce operational air quality impacts are not required.

### 3.2.5 MITIGATION MEASURES

#### 3.2.5.1 Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts during the construction phase. Therefore, the following mitigation measures will be imposed on any future refinery project that is comprised of installing air pollution control equipment to reduce emissions associated with construction activities

- A-1 Develop a Construction Emission Management Plan for the proposed project. The Construction Emission Management Plan shall be submitted to BAAQMD CEQA for approval prior to the start of construction. At a minimum the Construction Emission Management Plan will include the following mitigation measures.

#### On-Road Mobile Sources:

- A-2 The Emission Management Plan shall include measures to minimize emissions from vehicles including, but not limited to, consolidating truck deliveries, prohibiting truck idling in excess of five minutes as contract conditions with carriers and by posting signs onsite, specifying truck routing to minimize congestion emissions, specifying hours of delivery to avoid peak rush-hour traffic, allowing ingress/egress only at specified entry/exit points to avoid heavily congested traffic intersections and streets, and specifying allowable locations of onsite parking.

#### Off-Road Mobile Sources:

- A-3 Prohibit construction equipment from idling longer than five minutes at the refinery as a contract condition with construction companies and by posting signs onsite.
- A-4 Maintain construction equipment tuned with two to four degree retard diesel engine timing or tuned to manufacturer's recommended specifications that optimize emissions without nullifying engine warranties.
- A-5 The refinery operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions Management Plan. Electric welders shall be used in all construction areas that are served by electricity.
- A-6 The refinery operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions

Management Plan. Onsite electricity rather than temporary power generators shall be used in all construction areas that are served by electricity.

- A-7 If cranes are required for construction, the refinery operator shall use cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines. Engines equivalent to Tier 4 may consist of Tier 3 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting cranes rated 200 hp or greater with PM and NOx control devices must occur before the start of construction. If cranes rated 200 hp or greater equipped with Tier 4 engines are not available or cannot be retrofitted with PM and NOx control devices, the refinery operator shall use cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines. The refinery operator shall provide documentation in the Construction Emissions Management Plan or associated subsequent status reports as information becomes available that cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines are not available.
- A-8 For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the refinery operator shall use equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines. Engines equivalent to Tier 4 may consist of Tier 3 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting equipment rated 50 to 200 hp with PM and NOx control devices must occur before the start of construction. If equipment rated 50 to 200 hp equipped with Tier 4 engines is not available or cannot be retrofitted with PM and NOx control devices, the refinery operator shall use equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines. The refinery operator shall provide documentation in the Construction Emissions Management Plan or associated subsequent status reports as information becomes available that equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines are not available.
- A-9 Suspend use of all construction activities that generate air pollutant emissions during Spare the Air days called by the Air District.

#### 3.2.5.1.1 Remaining Construction Impacts

In spite of implementing the construction air quality mitigation measures above, it is likely that installing large-scale air pollution equipment, such as a WGS, or installation two or more types of air pollution control equipment concurrently, it is likely that construction air quality impacts would continue to exceed any applicable construction air quality significance thresholds and, therefore, remain significant.

### **3.2.5.2 Operation Mitigation Measures**

Because operation air quality impacts were concluded to be less than significant, mitigation measures are not required.

### **3.2.6 CUMULATIVE AIR QUALITY IMPACTS**

Pursuant to CEQA Guidelines §15130(a), “An EIR shall discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not “cumulatively considerable,” a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. Further, CEQA Guidelines §15130 requires that an EIR reflect the severity of the cumulative impacts from a proposed project and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness. Cumulative impacts are defined by CEQA as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (CEQA Guidelines, §15355). Cumulative impacts are further described as follows:

- The individual effects may be changes resulting from a single project or a number of separate projects. (State CEQA Guidelines §15355(a).
- The cumulative impacts from several projects are the changes in the environment which result from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines, §15355(b)).
- A “cumulative impact” consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR. (CEQA Guidelines, §15130(a)(1)).

With regard to related projects or projects with related environmental impacts, because the proposed project consists of promulgating two regulations, Regulation 12-15 (Tracking Rule) and Regulation 12-16 (Emission Risk Limits Rule), related projects would consist of other past, present, and probable future BAAQMD rules and regulations, as well as 2010 Clean Air Plan control measures. Therefore, cumulative air quality impacts will be considered in light of other BAAQMD rules and regulations and Clean Air Plan control measures.

### **3.2.6.1 Criteria Air Pollutants**

#### **3.2.6.1.1 Construction Air Quality Impacts**

In the analysis of construction air quality impacts it was concluded that air quality impacts from construction activities would be significant from implementing the proposed project because it is likely that installing one large or two or more moderately-sized pieces of air pollution control equipment would likely exceed the applicable BAAQMD significance thresholds for construction air quality impacts. Further, it was concluded that, even after implementing mitigation measures, construction air quality impacts would continue to exceed the applicable significance thresholds for construction. Thus, the air quality impacts due to construction are considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, generate significant adverse cumulative construction air quality impacts. It should be noted, however, that the air quality analysis is a conservative, "worst-case" analysis so the actual construction impacts are not expected to be as great as estimated here. Further, the construction activities are temporary and would be terminated once any future construction activities are completed.

#### **3.2.6.1.2 Operational Air Quality Impacts**

Based on the evaluation of air pollution control technologies that would most likely be the used to reduce SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions from affected refineries if required pursuant to Regulation 12-16, direct or indirect operational air quality impacts from the proposed project were concluded to be minor and less than significant. Because operational emissions do not exceed the applicable operational air quality significance thresholds, which also serve as the cumulative significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative operational impacts.

Implementing control measures contained in the Clean Air Plan, in addition to the air quality benefits of the existing rules, is anticipated to help bring the San Francisco Bay Area Air Basin into attainment with all national and state ambient air quality standards. Therefore, cumulative operational air quality impacts from the proposed project, previous amendments and all other 2010 Clean Air Plan control measures considered together, are not expected to be significant because implementation of all 2010 Clean Air Plan control measures is expected to result in net emission reductions and overall air quality improvement.

### **3.2.6.2 Toxic Air Contaminants**

It was concluded for the analysis of TAC air quality impacts, that TAC emissions from operation of a WGS be minor and less than significant. Because operational TAC emissions do not exceed the applicable cancer and non-cancer health risk significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative cancer and non-cancer health risk impacts.

### **3.3 GREENHOUSE GAS EMISSIONS**

The NOP/IS (see Appendix A) determined the greenhouse gas (GHG) impacts of proposed new rules were potentially significant. As discussed below, potential cumulative impacts of GHG emissions on climate changes are evaluated in Chapter 3.3 of this EIR.

#### **3.3.1 ENVIRONMENTAL SETTING**

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs identified by the Kyoto Protocol are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions. An emissions inventory is a detailed estimate of the amount of air pollutants discharged into the atmosphere of a given area by various emission sources during a specific time period. The GHG inventory for California is presented in Table 3.3-1 (CARB, 2014). More than 80 percent of GHG emissions in California are from fossil fuel combustion.

The emission inventory in Table 3.3-2 focuses on GHG emissions due to human activities only, and compiles estimated emissions from industrial, commercial, transportation, domestic, forestry, and agriculture activities in the San Francisco Bay Area region of California. The GHG emission inventory in Table 3.3-2 reports direct emissions generated from sources within the Bay Area.



**Table 3.3-1**

**California GHG Inventory for 2002 – 2012 – By Sector**

<b>Emissions</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Electricity Generation (In State)	49.89	48.26	49.35	45.25	50.05	54.31	54.50	53.45	46.87	41.34	51.18
Electricity Generation (Imports)	59.07	64.66	66.15	62.90	54.76	59.89	65.91	48.13	43.67	46.94	44.15
Transportation	186.07	185.99	189.54	191.96	192.12	192.29	181.27	174.89	174.02	171.69	171.01
Industrial*	101.62	101.19	103.33	101.47	99.65	96.72	97.51	95.20	99.33	99.69	100.67
CHP: Industrial	10.65	10.60	12.92	12.41	12.17	11.16	10.40	12.55	12.60	11.14	10.82
Landfills	7.14	7.26	7.24	7.40	7.42	7.53	7.66	7.78	7.86	7.92	7.97
Manufacturing	28.66	25.11	25.40	24.58	24.88	22.84	23.63	20.34	22.40	24.39	24.88
Mining	0.31	0.34	0.36	0.34	0.11	0.16	0.19	0.14	0.15	0.15	0.16
Not Specified Industrial	2.44	2.45	2.64	2.81	3.04	3.17	3.35	3.48	4.04	4.16	4.24
Oil & Gas Extraction	17.65	20.21	19.90	18.59	16.94	17.00	18.22	17.12	16.18	16.22	16.86
Petroleum Marketing	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.03	0.03
Petroleum Refining	29.13	29.77	29.01	29.68	29.58	29.14	28.35	28.27	30.32	30.05	29.81
Pipelines	2.88	2.70	3.05	2.79	2.65	2.82	2.80	2.66	2.86	2.71	2.97
Solid Waste Treatment	0.29	0.31	0.33	0.36	0.38	0.40	0.43	0.45	0.47	0.50	0.52
Wastewater Treatment	2.47	2.45	2.47	2.50	2.49	2.51	2.47	2.41	2.45	2.44	2.42
Commercial	16.58	15.76	16.52	16.57	17.35	17.92	18.47	19.76	21.10	21.75	22.02
Residential	30.87	30.43	31.50	30.23	30.61	30.78	31.22	30.96	32.12	32.99	31.59
Agriculture & Forestry	35.99	36.50	36.26	36.54	37.75	37.03	37.99	35.84	35.73	36.34	37.86
Not Specified	0.23	0.27	0.21	0.20	0.22	0.22	0.23	0.21	0.22	0.21	0.21
<b>California Total Emissions</b>	<b>480.32</b>	<b>483.05</b>	<b>492.86</b>	<b>485.13</b>	<b>482.52</b>	<b>489.16</b>	<b>487.10</b>	<b>458.44</b>	<b>453.06</b>	<b>450.94</b>	<b>458.68</b>

Source: CARB, 2014

\* Subcategories of industrial emissions listed to include refineries

**TABLE 3.3-2**

**Bay Area Greenhouse Gas Emission Inventory Projections**  
(Million Metric Tons CO<sub>2</sub>-Equivalent)

<b>SOURCE CATEGORY</b>	<b>Year</b>	<b>2005</b>	<b>2009</b>	<b>2012</b>	<b>2015</b>	<b>2020</b>
<b>INDUSTRIAL/COMMERCIAL</b>						
<i>Oil Refineries</i>						
Refining Processes		3.4	3.5	3.6	3.7	3.9
Refinery Make Gas Combustion		4.7	4.9	5.0	5.2	5.4
Natural Gas and Other Gases Combustion		4.8	5.0	5.1	5.3	5.5
Liquid Fuel Combustion		0.1	0.1	0.1	0.1	0.1
Solid Fuel Combustion		1.0	1.0	1.1	1.1	1.1
<i>Waste Management</i>						
Landfill Combustion Sources		0.0	0.0	0.0	0.0	0.0
Landfill Fugitive Sources		1.2	1.2	1.2	1.2	1.2
Composting/POTWs		0.4	0.4	0.4	0.4	0.4
<i>Other Industrial/ Commercial</i>						
Cement Plants		0.9	0.9	0.9	0.9	1.0
Commercial Cooking		0.1	0.1	0.1	0.1	0.2
ODS Substitutes/Nat. Gas Distrib./Other		3.6	5.2	6.3	7.5	9.4
Reciprocating Engines		0.6	0.6	0.6	0.7	0.7
Turbines		0.4	0.4	0.4	0.4	0.4
Natural Gas- Major Combustion Sources		1.6	2.5	2.6	2.7	2.8
Natural Gas- Minor Combustion Sources		8.8	9.2	9.5	9.9	10.4
Coke Coal		1.0	1.0	1.1	1.1	1.2
Other Fuels Combustion		0.3	0.4	0.4	0.4	0.4
Subtotal		32.8	36.3	38.4	40.6	44.2
<b>RESIDENTIAL FUEL USAGE</b>						
Natural Gas		6.4	6.6	6.8	6.9	7.2
LPgas/Liquid Fuel		0.2	0.2	0.2	0.2	0.2
Solid Fuel		0.1	0.2	0.2	0.2	0.2
Subtotal		6.7	6.9	7.1	7.2	7.5
<b>ELECTRICITY/ CO-GENERATION</b>						
Co-Generation		5.5	5.5	5.7	6.0	6.4
Electricity Generation		2.8	3.1	3.2	3.3	3.5
Electricity Imports		6.8	7.3	7.6	7.9	8.3
Subtotal		15.1	15.8	16.5	17.2	18.3
<b>OFF-ROAD EQUIPMENT</b>						
Lawn and Garden Equipment		0.1	0.1	0.1	0.1	0.1
Construction Equipment		1.7	1.9	1.9	2.0	2.2
Industrial Equipment		0.7	0.8	0.8	0.9	1.0
Light Commercial Equipment		0.2	0.2	0.3	0.3	0.3
Subtotal		2.8	3.0	3.2	3.3	3.6
<b>TRANSPORTATION</b>						
<i>Off-Road</i>						
Locomotives		0.1	0.1	0.1	0.1	0.1
Ships		0.7	0.8	0.8	0.9	1.0
Boats		0.6	0.6	0.5	0.5	0.6

**TABLE 3.3-2 (concluded)**

**Bay Area Greenhouse Gas Emission Inventory Projections**  
(Million Metric Tons CO<sub>2</sub>-Equivalent)

<b>SOURCE CATEGORY</b>	<b>Year</b>	<b>2005</b>	<b>2009</b>	<b>2012</b>	<b>2015</b>	<b>2020</b>
Commercial Aircraft		1.8	2.0	2.1	2.3	2.6
General Aviation		0.2	0.2	0.2	0.3	0.3
Military Aircraft		0.5	0.5	0.5	0.5	0.5
<i>On-Road</i>						
Passenger Cars/Trucks up to 10,000 lbs		26.6	27.1	27.9	29.0	30.9
Medium/Heavy Duty Trucks > 10,000 lbs		3.3	3.3	3.4	3.5	3.7
Urban, School and Other Buses		0.8	0.8	0.8	0.8	0.9
Motor-Homes and Motorcycles		0.2	0.2	0.2	0.2	0.2
Subtotal		34.8	35.6	36.7	38.1	40.7
<b>AGRICULTURE/FARMING</b>						
Agricultural Equipment		0.2	0.2	0.2	0.2	0.2
Animal Waste		0.6	0.6	0.6	0.6	0.6
Soil Management		0.3	0.3	0.3	0.3	0.3
Biomass Burning		0.0	0.0	0.0	0.0	0.0
Subtotal		1.1	1.1	1.1	1.1	1.1
<b>GRAND TOTAL EMISSIONS</b>		<b>93.4</b>	<b>98.7</b>	<b>103.0</b>	<b>107.5</b>	<b>115.4</b>

Source: BAAQMD, 2010

In response to growing scientific and political concern regarding global climate change, California has recently adopted a series of laws over the last decade to reduce both the level of GHGs in the atmosphere and to reduce emissions of GHGs from commercial and private activities within the state.

In September 2006, Governor Schwarzenegger signed California's Global Warming Solutions Act of 2006 (AB32). AB32 required CARB to:

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

In October 2011, CARB approved the cap-and-trade regulation, marking a significant milestone toward reducing California's greenhouse gas emissions under its AB 32 law. The regulation sets a statewide limit on the emissions from sources responsible for 80 percent of California's greenhouse gas emissions. The regulation covers about 360 businesses representing 600 facilities and is divided into two broad phases: an initial phase beginning in 2012 that included all major industrial sources along with utilities; and, a second phase that started in 2015 and included distributors of transportation fuels, natural gas and other fuels.

Companies are not given a specific limit on their greenhouse gas emissions but must supply a sufficient number of allowances (each covering the equivalent of one ton of carbon dioxide) to cover their annual emissions. Each year, the total number of allowances issued in the state drops, requiring companies to find the most cost-effective and efficient approaches to reducing their emissions. By the end of the program in 2020 there will be a 15 percent reduction in greenhouse gas emissions compared to today, reaching the same level of emissions as the state experienced in 1990, as required under AB 32.

There has also been activity at the federal level on the regulation of GHGs. On October 30, 2009, the U.S. EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires reporting of GHG emissions from large sources and suppliers (facilities that emit 25,000 metric tons of GHGs per year or more) in the United States, and is intended to collect accurate and timely emissions data to inform policy decision.

### **3.3.2 EXISTING REGULATORY SETTING**

The federal, state, and local air quality regulations applicable to GHGs are identified below in further detail.

#### **3.3.2.1 Federal Regulations**

Congress passed the Consolidated Appropriations Act of 2008 (HR 2764) in December 2007, which requires reporting of GHG data and other relevant information from large emission sources and suppliers in the United States. The act is referred to as 40 CFR 98, Greenhouse Gas Reporting Program. The stated purpose of the act is to collect accurate and timely GHG data to inform future policy decisions. Facilities that emit 25,000 metric tons per year or more per year of GHGs are required to submit annual reports to the U.S. EPA. The U.S. EPA extended the deadline for reporting initial year (2010) GHG data to September 30, 2011.

#### **3.3.2.2 California Regulations**

Assembly Bill 32 – California Global Warming Solutions Act of 2006 AB 32 was signed into law by then-governor Arnold Schwarzenegger on September 27, 2006 and it is the first law to limit GHG emissions at the state level. The Act directs the State to reduce California emissions of GHG to 1990 levels by 2020. It instructs CARB to establish a

program of regulatory and market mechanisms to achieve GHG reductions and to implement a mandatory GHG reporting and verification program. AB 32 required the CARB to finalize GHG emission limits and reduction measures by January 1, 2011 and to implement them by January 1, 2012.

On October 20, 2011, CARB adopted the final cap-and-trade regulation. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions. The regulation includes an enforceable GHG cap that will decline over time. All refineries affected by Regulation 12-15 and 12-16 are regulated under CARB's cap-and-trade program. CARB distributed allowances, which are tradable permits, equal to the emissions allowed under the cap. On May 24, 2012, CARB considered proposed amendments to the California GHG emissions cap-and-trade program and market-based compliance mechanisms to add security to the market system and help staff implement the cap-and-trade program.

Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB. CARB identified the Low Carbon Fuel Standard (LCFS) as a Discrete Early Action under AB 32. In 2009, CARB approved for adoption the LCFS regulation, which became fully effective in April 2010 and is codified at 17 CCR 95480–95490. The LCFS will reduce greenhouse gas emissions by reducing the carbon intensity of transportation fuels used in California by at least 10 percent by 2020.

### **3.3.2.3 BAAQMD Regulations**

The Air District's Ten Point Climate Action Work Program calls for enhanced GHG emissions inventory and forecasting, and the implementation of GHG emissions monitoring; both of which will impact the five Bay Area refineries.

### **3.3.3 THRESHOLDS OF SIGNIFICANCE**

The GHG emission impacts that exceed the GHG emissions significance threshold of 1,100 metric tons of CO<sub>2</sub> equivalent per year (MT CO<sub>2</sub> eq./yr) identified in the District's *California Environmental Quality Act Air Quality Guidelines* (BAAQMD, 2011). Similarly, demolition and construction GHG emissions impacts from installing a single large-scale air pollution control unit, a single WGS for example, which could take up to 18 months to complete construction, would likely exceed the applicable construction GHG emissions significance threshold identified in the District's *California Environmental Quality Act Air Quality Guidelines* (BAAQMD, 2011). Since GHG impacts are based on total cumulative emission, typically over a single year timeframe, construction GHG from installing air pollution control technologies at all affected refineries would contribute to overall GHG emissions impacts. Therefore, based on the above information, construction GHG emissions impacts from the proposed project are concluded to be significant and mitigation measures are required.

As discussed in Section 3.2.3, revised 2011 CEQA Guidelines established a significance threshold for regional plans of “no net increase in emissions of GHG’s, criteria air pollutants and precursors, and toxic air contaminants.” The 2011 CEQA Guidelines also established a project specific GHG significance threshold of 1,100 metric tons of CO<sub>2</sub> equivalent per year (MT CO<sub>2</sub> eq./yr) (BAAQMD, 2011). The CEQA Thresholds for air quality plans are more conservative than project-specific CEQA Thresholds, as the significance threshold is zero, i.e., any increase in GHG emissions would be considered significant. Therefore, in order to provide a conservative air quality analysis, the thresholds recommended in the revised 2011 CEQA Guidelines (BAAQMD, 2011) will be used in the current air quality impacts analysis. Further, no GHG emissions were provided in the BAAQMD 1999 CEQA Guidelines.

### **3.3.4 ENVIRONMENTAL IMPACTS**

GHG emissions impacts occur as increased accumulation of GHGs in the atmosphere that 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. Although the geographic scope of this GHG emissions impact analysis in this EIR is the State of California, it is the cumulative effects of all global GHG emissions sources that have the potential result in global climate change. For this reason, GHG emission impacts contributing to global climate change are considered a cumulative impact analysis rather than a project-specific analysis.

With regard to potential GHG emission impacts, most sources of GHG emissions at a typical refinery would include equipment or processes that include combustion as part the operations. Though the proposed project may involve combustion processes that could generate GHG emissions such as CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbon (HFC) or perfluorocarbon (PFC). GHGs could be emitted during construction activities to install air pollution control equipment from sources such as off-road construction equipment, which could be comprised of off-road mobile sources, e.g., bull dozers, cranes, forklifts, etc., and stationary sources such as generators used for welding or to generate electricity. GHGs could also be emitted during construction from on-road mobile sources such as haul trucks and construction worker commute trips. During operation GHG emission impacts could occur from air pollution control equipment that uses combustion as part of the control process. GHG emissions from existing refinery operations are part of the existing setting. Further, operational sources of GHG emissions are subject to the GHG emission reductions on the AB 32 Cap and Trade program. Therefore, existing sources of GHG emissions are not included as part of the analysis of GHG impacts analyzed in the following sections.

### 3.3.4.1 Potential GHG Emission Impacts During Construction

GHG emissions sources during construction to install air pollution control equipment would generally be the same types of sources as described in the construction criteria pollutant emission sources discussion in Section 3.2.4.1 above. For example, as described in Subsection 3.2.4.1 construction GHG emissions to install a WGS, one of the largest types of air pollution control equipment that could be installed in response to Regulation 12-16, would occur over an 18-month period; one month to demolish any nearby existing equipment or structures and 17 months to construct the WGS. Demolition activities were assumed to require a construction crew of 50 workers and the use of: one or more of the following types of equipment: crane, front-end loader, forklift, demolition hammer, water truck, medium-duty flatbed truck, etc. Constructing a WGS was assumed to require a construction crew of 175 workers and the use of one or more of the following types of construction equipment: backhoes, cranes, man lifts, forklift, front end loaders generators, diesel welding machines, jack hammers, a medium-duty flatbed truck, a medium-duty dump truck, a cement mixer, etc. Construction equipment activities and equipment to install most other types of air pollution control equipment would tend to be substantially less than those necessary to construct a WGS.

As discussed in the Section 3.2.4.1 above, construction and installation of some types of air pollution control technologies, baghouses, compressors, cyclones, DOCs, DPFs, etc., for example, would not necessarily be expected to result in significant adverse construction GHG impacts on an individual project-specific basis. Installation of two or more relatively small air pollution control technologies concurrently, however, could generate adverse GHG emission impacts that exceed the GHG emissions significance threshold. Similarly, demolition and construction GHG emissions impacts from installing a single large-scale air pollution control unit, a single WGS for example, which could take up to 18 months to complete construction, would also exceed the applicable construction GHG emissions significance threshold identified in the District's *California Environmental Quality Act Air Quality Guidelines* (BAAQMD, 2011). Since GHG impacts are based on total cumulative emission, typically over a single year timeframe, construction GHG from installing air pollution control technologies at all affected refineries would contribute to overall GHG emissions impacts. Therefore, based on the above information, construction GHG emissions impacts from the proposed project are concluded to be significant and mitigation measures are required.

**3.3.4.2 Potential GHG Emission Impacts During Operation**

The analysis of operational GHG emission impacts from the proposed project would include direct GHG emissions from air pollution control equipment and indirect emissions, e.g., haul truck emissions from transporting fresh supplies of caustic. Table 3.3-3 shows air pollution control technologies that would be the most likely technologies installed at affected refineries to reduce SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions and that may have the potential to generate direct or indirect GHG emission impacts during operation. The discussion below further evaluates those air pollution control technologies identified in Table 3.3-3 that have the potential to generate adverse direct or indirect operational GHG emission impacts. Air pollution control technologies where no direct or indirect operational GHG emission impacts were identified will not be discussed further.

**TABLE 3.3-3**

**Potential Operation GHG Emission Impacts from Installing Air Pollution Control Equipment**

<b>Potential Control Technology</b>	<b>Direct or Indirect GHG Impacts Identified</b>	<b>Significant?</b>
Baghouse	None identified	No
Compressor	None identified	No
Cyclone	None identified	No
Diesel Oxidation Catalyst	None identified	No
Diesel Particulate Filter	None identified	No
Electrostatic Precipitator (Wet & Dry)	None identified	No
Flue Gas Treatment (Additive to Existing Amine System)	None identified	No
Flue Gas Treatment (Mercox)	None identified	No
Selective Oxidation Catalyst	None identified	No
SO <sub>x</sub> Reducing Additive	None identified	No
New Diesel ICEs	None identified	No
Wet Gas Scrubber	Indirect mobile source GHG emissions	Yes

As indicated in Subsection 3.2.4.2.3, installing a wet gas scrubber would not generate direct combustion emissions because the control process does not include a combustion source. Addition of a WGS does increase pressure drop in the flue gas system.



Additional power may be needed to compensate for this additional pressure drop, which can be significant. Based on information from Belco Engineering, it is estimated that a new wet gas scrubber would use approximately 3,000 MWhr per year of electricity. The production of electricity to operate the WGSs would generate GHG emissions. The estimated GHG emission increase associated with increased electricity use for WGS is shown in Table 3.3-4.

**TABLE 3.3-4**

**GHG Emissions from Electricity Use at Wet Gas Scrubbers**

<b>Total GHG Emissions</b>	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>CO<sub>2</sub>e</b>
PG&E GHG Emissions Factors (lb/MWhr)	641	0.029	0.00617	643.52
Annual Emissions (lb)	1,923,000	87	19	1,930,565
Annual Emissions (MT)	872	0	0	876

Note: Emission factors from CalEEMod Users Guide. (CAPCOA, 2013)

The estimated increase in GHG emissions associated with one WGS would be about 876 MT of CO<sub>2</sub>e and the estimated increase associated with three WGS would be approximately 2,628. Since the GHG threshold for air quality plans, rules and regulations is zero, the GHG emissions would be considered potentially significant.

Indirect GHG emission impacts could occur from haul trucks associated with delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis. It was assumed in the air quality analysis that up to 50 additional delivery truck trips per year for each WGS constructed would be necessary. Because haul truck trips transporting caustic would occur relatively infrequently and it is not likely that all affected refineries would reduce SO<sub>2</sub> emissions using a WGS, haul truck GHG emissions from carrying caustic would be very low. Therefore, GHG emissions from transporting caustic to affected refineries that install a WGS would not be significant.

**3.3.4.3 Conclusion**

Although the evaluation of those air pollution control technologies that would most likely be used to reduce SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions from affected refineries, if required pursuant to Regulation 12-16, could generate direct or indirect GHG emission impacts which are potentially significant.

CARB has designed a California Cap-and-Trade program that is enforceable and meets the requirements of AB 32. The program began on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions inventory. The refineries are subject to the requirements of the AB32 Cap-and-Trade Program and have a GHG allocation based on current GHG emissions levels. The AB32 Cap-and-Trade Program has divided allocations into sectors and established a Refinery Sector allocation. The

Refinery Sector allocation is distributed among the refineries based on the complexity and energy efficiency of each refinery. The more energy efficient a refinery is, the greater the allocation it receives. Additionally, the refinery allocation process includes both on-site generated and third-party power. The AB32 Cap-and-Trade Program requires that the refineries subject to the program (including all refineries in the Bay Area) to offset any GHG emissions in excess of the total allocation obtained through the program. As the emissions cap is gradually reduced over time, and as additional sources are brought under the cap to include the vast majority of emissions in the State, the program will ensure that California remains on track to continually reduce GHG emissions and meet the 2020 limit. Currently, there are no GHG reduction requirements for construction equipment in effect in the AB 32 reduction goals.

Should WGSs be installed, GHG offsets would be required. As such, the GHG emissions associated with the WGSs would be required to be offset, so that there would be no net increase in GHG emissions from the refineries. Therefore, any GHG emissions increases would be offset and there would be no net GHG emissions increase. Thus, the GHG operational emissions due to implementation of Rule 12-15 and 12-16 are considered less than significant.

### **3.3.5 MITIGATION MEASURES**

BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, the BAAQMD recommends that lead agencies quantify and disclose GHG emissions that would occur during construction, and make a determination on the significance of these construction-generated GHG emission impacts in relation to meeting AB 32 GHG reduction goals.

With regard to GHG construction emission impacts the BAAQMD's California Environmental Quality Act Air Quality Guidelines recommend that project proponents incorporate best management practices to reduce GHG emissions during construction, as applicable. Best management practices may include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using local building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials.

To the extent that construction mitigation identified in Section 3.2.5.1 for criteria and precursor pollutant reduce combustion emissions, they will also serve to reduce GHG emissions. Therefore, the construction mitigation measures identified in Section 3.2.5.1 above are included herein as mitigation measures to reduce GHG emissions impacts.

In addition to the construction mitigation measures identified in Section 3.2.5.1 above, the following mitigation measures are also required.

- GHG-1 Incorporate best management practices specifically to reduce GHG emissions during construction, as applicable.

- GHG-2 Use alternative fueled (e.g., biodiesel, electric) construction vehicles or equipment of at least 15 percent of the fleet.
- GHG-3 Use at least 10 percent local building materials.
- GHG-4 Recycle or reuse at least 50 percent of construction waste or demolition materials.
- GHG-5 When air pollution control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the control equipment.

**3.3.5.1 Remaining Construction Impacts**

In spite of implementing the construction air quality mitigation measures in Section 3.2.5.1 and the additional GHG mitigation measures identified in the section above, it is likely that installing large-scale air pollution equipment, such as a WGS, or installation two or more types of air pollution control equipment over the course of a year, that GHG emission impacts would continue to exceed the GHG significance threshold identified in the District's California Environmental Quality Act Air Quality Guidelines (BAAQMD, 2011) and, therefore, remain significant.

### 3.4 HAZARDS AND HAZARDOUS MATERIALS

The NOP/IS (see Appendix A) determined the hazards and hazardous materials impacts of proposed new Rules were potentially significant. As discussed below, potential cumulative impacts of hazards and hazardous materials are evaluated in Chapter 3.4 of this EIR.

#### 3.4.1 ENVIRONMENTAL SETTING

The goal of the proposed tracking and mitigation rules is to attain and maintain the State ozone standard as well as reducing ambient concentrations of particulate matter and TACs, thus improving air quality and protecting public health. Rule 12-16 could provide threshold trigger levels that will require a refinery owner/operator to submit an Emission Reduction Plan (ERP). Some of the pollution control equipment which may be installed to comply with an ERP may have direct or indirect hazards associated with their implementation. Hazard concerns are related to the potential for fires, explosions or the release of hazardous substances in the event of an accident or upset conditions.

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at the five refineries located in the Bay Area. Examples of hazardous materials used in refineries include flammable materials, combustible materials and corrosive materials. Currently, hazardous materials are transported throughout the district via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with petroleum refining activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the refinery. 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 or gasoline), 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 industrial facilities, e.g., refineries and chemical plants. 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.

### 3.4.1.1 Hazardous Materials Incidents

The Department of Transportation, Office of Pipeline and Hazardous Materials Safety Administration (PHMSA) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials. Information on accidental releases of hazardous materials is reported to PHMSA. In 2014, 1,451 hazardous materials incidents that occurred within California were reported to PHMSA. The incidents resulted in 18 injuries (non-hospitalized), four people hospitalized, and caused about \$2.6 million in damages (PHMSA, 2014).

In the last ten years about 54 hazardous materials incidents related to ammonia releases that occurred within California have been reported to PHMSA. Seven of those incidents were in the Bay Area. The incidents resulted in 4 injuries (non-hospitalized), one person hospitalized, and caused about \$148,000 in damages (PHMSA, 2014).

The California Hazardous Materials Incident Reporting System (CHMIRS) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials. Information on accidental releases of hazardous materials are reported to and maintained by OES. In 2007, there were a total of 1,312 incidents reported in the nine counties regulated by the BAAQMD. The statistical information is from a widely distributed cross section of sources in California. These data may not accurately represent the actual occurrences of incidents throughout the state because of differences in population, non-uniform distribution of commercial and industrial facilities, and differences in resources between participating agencies statewide.

### 3.4.2 REGULATORY SETTING

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 business 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 considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

### **3.4.3 SIGNIFICANCE THRESHOLDS**

The following thresholds of significance are generally based on Appendix G to the CEQA Guidelines. Implementation of the proposed project may have a significant adverse impact on hazards and hazardous materials if it would result in any of the following:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- 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.

### **3.4.4 ENVIRONMENTAL IMPACTS**

For any refineries that are shown to exceed the refinery-wide emissions limits for SO<sub>2</sub> and PM<sub>2.5</sub> emissions or the cancer or non-cancer significant risk levels, it is expected that refinery operators would install new or modify their existing air pollution control equipment in order to reduce the applicable emissions to comply with future Regulation 12-16 requirements. Because refineries handle a number of hazardous materials, potential hazards and hazardous materials impacts already exist; are generally common to most oil processing facilities worldwide; and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection, and mitigation systems. The major types of public safety risks at a refinery consist of risks from accidental releases of regulated substances and from major fires and explosions.

Installation of new or modifications to existing air pollution control technologies may generate new hazards at the affected refineries from the use, storage and transport of potentially hazardous materials during operation-related activities. Some of the key effects of implementing Regulation 12-16 and the determination of which types of air pollution control equipment involve hazards and hazardous materials focus on: 1) the anticipated increase of potentially hazardous substances used to operate the new air pollution control equipment and the anticipated replacement and/or supplement of substances used to modify or upgrade existing air pollution control systems; and, 2) the increased capture of hazardous substances as part of the overall emission reduction effort. Some control technologies are inherently dangerous or may use hazardous materials, which could contribute to significant adverse hazard or hazardous materials impacts.

Table 3.4-1 shows air pollution control technologies that would provide the best opportunities for obtaining further reductions in SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions. Table 3.4-1 also identifies the types of hazards or hazardous materials impacts that may be generated by the control technologies under evaluation. Those air pollution control technologies shown in Table 3.4-1 where no hazards or hazardous materials impacts were identified will not be evaluated further. Air pollution control technologies that have the potential to generate hazard or hazardous materials impacts are analyzed further in the subsections below.

**TABLE 3.4-1**

**Potential Control Technologies and Types of Potential Hazard or Hazardous Materials Impacts**

<b>Potential Control Technology</b>	<b>Hazard Impacts</b>	<b>Significant?</b>
Baghouse	Potential for fire or explosion	No <sup>1</sup>
Compressor	Potential hazards associated with DCU depressurization	No
Cyclone	None identified	No
Diesel Oxidation Catalyst	None identified	No
Diesel Particulate Filter	None identified	No
Electrostatic Precipitator – Dry	Potential for explosion	No <sup>1</sup>
Electrostatic Precipitator – Wet	Potential for explosion	No
Fuel Gas Treatment (Additive to Existing Amine System)	Potential hazards associated with increased use of amines	No
Fuel Gas Treatment (Merox Treatment)	Potential hazards associated with increased use of Merox	No
Selective Oxidation Catalyst	Potential hazards associated with the catalyst	No
Selective Oxidation Catalyst	Potential accidental release of catalyst during transport	No
SO <sub>x</sub> Reducing Additive	Potential hazards associated with additives	No
New Diesel ICEs	None identified	No
Wet Gas Scrubber	None identified	No
Wet Gas Scrubber	Potential for accidental release of caustic during transport	No

<sup>1</sup> Implementing mitigation measures in Section 3.4.5 reduces impacts to less than significant.

**3.4.4.1 Baghouse**

Dusts have a very large surface area compared to their mass. Since burning can only occur at the surface of a solid or liquid, where it can react with oxygen, this causes dusts to be much more flammable than bulk materials. Explosions are another operating hazard. For an explosion to occur, the concentration of dust in the baghouse housing or duct must be between the lower and upper explosive concentrations and a spark must be



present. In mechanical cleaning (shaker) collectors, the flow is stopped in the filter compartment and the filter elements are agitated all at the same time. A potential for an explosion occurs since the concentration will likely pass through the explosive limits during this action.

At least 281 combustible dust fires and explosions from baghouses occurred in general industries between 1980 and 2005 in the United States, which caused at least 119 fatalities and 718 injuries (Dalsanto, 2011). Unfortunately, this reference did not break out the types of industrial facilities where these accidents occurred. However, based on the chemical and physical characteristics of the dusts involved, e.g., organic, sulfur, coke, etc., it is assumed that at least some of these accidents occurred at petroleum refineries. Therefore, in light of the fact that there is a potential for explosion or fire hazards, to be conservative it is concluded here that baghouses may cause or contribute to significant adverse hazard and hazardous materials impacts. Therefore, mitigation measures have been identified in Section 3.4.5.

#### **3.4.4.2 Replace Existing Diesel ICEs**

Diesel ICEs are often used to provide electricity in certain areas of a refinery or used as a backup source of electricity in the event of a power outage. Therefore, the use of diesel ICEs can prevent hazards associated with loss of electricity and unit shutdowns. Replacing existing older diesel ICEs with new diesel ICEs is not expected to change the hazards associated with their operation. It is possible that newer ICEs are more efficient and less likely to breakdown. However, the hazards associated with replacing ICEs are not expected to change over the existing conditions.

#### **3.4.4.3 Electrostatic Precipitator**

Electrostatic precipitators have several advantages compared with other air pollution control devices, in part, because they are very efficient collectors, even for small particles. Further, because the collection forces act only on the particles, ESPs can treat large volumes of gas with low pressure drops. They can collect dry materials, fumes, or mists. Electrostatic precipitators can also operate over a wide range of temperatures and generally have low operating costs. There are two broad types of ESPs, dry and wet.

##### **3.4.4.3.1 Dry ESPs**

Dry ESPs remove dust from the collection electrodes by vibrating the electrodes through the use of rappers. Wire-plate dry ESPs are by far the most common design of an ESP and are used in a number of industries, including petroleum refining. Dry ESPs remove dust from the collection electrodes by vibrating the electrodes through the use of rappers. Common types of rappers are gravity impact hammers and electric vibrators. For a given ESP, the rapping intensity and frequency must be adjusted to optimize performance. Sonic energy is also used to assist dust removal in some dry ESPs. The main components

of dry ESPs are an outside shell to house the unit, high voltage discharge electrodes, grounded collection electrodes, a high voltage source, a rapping system, and hoppers.

Hazards associated with dry ESPs include fire and explosion hazards that can occur at the inlet to ESPs when highly charged dust particles are transported by a gas carrier that can contain the mixtures of both incombustible and combustible flue gases. The risk of ignition and even explosion is especially high in the presence of an explosive mixture of oxygen, hydrocarbons, carbon monoxide, etc. The ignition source is typically caused by the breakdown between the corona electrode and the collecting electrode, but in some cases electrostatic discharge (typically back corona,) can also act as an ignition source.

Other problems that may contribute to fire or explosion hazards include the following. Minimum clearance between electrodes may result in repeated “sparkover” causing local heating and vaporization of wires causing the wires to break. Broken wires may swing freely and cause shorting between discharge and collector electrodes. Excessive rapping may also break wires. Poor electrical alignment may cause the wire frame to oscillate fatiguing wires and increasing sparking. If high levels of carbon are known to exist on the collecting surface or in the hoppers, opening the precipitator access doors may result in spontaneous combustion of the hot dust caused by the inrush of air.

Electrostatic Precipitators or ESPs have been used in industry for over 60 years. Review of the safety record of dry ESPs over the last 20 years did not identify any explosion or fire hazards. However, in light of the fact that there is a potential for explosion or fire hazards, to be conservative it is concluded here that dry ESPs may cause or contribute to significant adverse hazard and hazardous materials impacts. Therefore, mitigation measures have been identified in Section 3.4.4.

#### 3.4.4.3.2 Wet ESPs

The basic components of a wet ESP are the same as those of a dry ESP with the exception that a wet ESP requires a water spray system rather than a system of rappers. The gas stream is either saturated before entering the collection area or the collecting surface is continually wetted to prevent agglomerations from forming. Because the dust is removed from a wet ESP in the form of a slurry, hoppers are typically replaced with a drainage system. Wet ESPs have several advantages over dry ESPs. Wet ESPs can adsorb gases, cause some pollutants to condense, are easily integrated with scrubbers, and eliminate re-entrainment of captured particles.

Particulates collected from wet ESPs are washed from the collection electrodes with water or another suitable liquid. Some wet ESP applications require that liquid is sprayed continuously into the gas stream; in other cases, the liquid may be sprayed intermittently. Since the liquid spray saturates the gas stream in a wet ESP, it also provides gas cooling and conditioning. Because particulates are removed from a wet ESP as a slurry, explosion hazards are unlikely (Dorman, 1974). Therefore, hazards and hazardous materials impacts from wet ESPs are concluded to be less than significant. Therefore, mitigation measures are not required.

#### 3.4.4.4 Fuel Gas Treatment (FGT)

Amine absorbers are typically used for reducing SO<sub>x</sub> emissions as part of FGT or as part of SRU/TGU systems operated at refineries. The type of amine used in these absorbers varies from process to process and sometimes the amines are paired up with a proprietary catalyst such as Merox for additional SO<sub>x</sub> control. The most common amines are DEA, MDEA, and MEA and their use is limited to removing H<sub>2</sub>S and CO<sub>2</sub> from sour gas streams. While none of these amines can remove mercaptans, DEA and MEA can be used to remove carbonyl sulfide.

##### 3.4.4.4.1 Amines

**DEA:** Of the following three amines, DEA, MDEA, and MEA, DEA is the only amine that is a TAC and carcinogenic. MDEA and MEA are not regulated substances pursuant to BAAQMD's Regulation 2-5. DEA is regulated as a hazardous compound substance pursuant to BAAQMD's Regulation 2-5. Located on the MSDS for DEA, the NFPA hazards ratings are follows: health is rated 1 (slightly hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none). Located on the MSDSs for MEA, the NFPA hazards ratings are follows: health is rated 3 (highly hazardous), flammability is rated 2 (moderately flammable) and reactivity is rated 0 (none). The NFPA has not assigned a rating for MDEA.

As previously noted, it is assumed that any affected refinery operator who installs a WGS pursuant to future Regulation 2-16 requirements, would likely use the same amines that are currently used for other refinery units or processes. In this situation, there would likely be increased throughput of the amine through the storage tank, but in the event of an accidental release, the hazard consequence would not change. Consequently, installation of an amine scrubber using DEA, MDEA, or MEA would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds. Therefore, potential hazards and hazardous materials impacts from increased usage of DEA, MDEA, or MEA would be less than significant. Therefore, mitigation measures are not required.

##### 3.4.4.4.2 Merox Treatment

Merox is a proprietary caustic scrubbing technology used for removing mercaptans and residual H<sub>2</sub>S from fuel gas. A Merox unit will typically consist of a column with three sections: 1) pre-wash; 2) extraction; and, 3) water wash. Feedstock enters the bottom of the column in the prewash section. The gas flows upward in the column where NaOH caustic is injected into the extraction section; the caustic acts as an absorbing agent to capture the mercaptans and convert them to sodium mercaptides. The spent caustic solution is regenerated by an oxidizer unit with catalyst injection to convert the mercaptides to disulfide oil. The disulfide oil is separated and then is typically sent

elsewhere within the refinery for further processing while the regenerated caustic soda is returned to the extraction section of the column.

If a Merox system is added to an existing absorber system, it is likely that the current amine solution would continue to be used. The addition or conversion to Merox technology will increase the amount of NaOH needed at any affected refineries. The analysis for the potential increases in NaOH are similar to the potential increase in NaOH for a WGS system, and is further addressed in Subsection 3.4.4.7.1 below. Based on available information, Merox catalyst that would be needed is approximately eight pounds per day or 3,000 pounds per year for the caustic regeneration portion of the Merox process for a typical absorber system.

Merox catalyst is comprised of a proprietary, cobalt-based reagent (a trade secret cobalt phthalocyanine sulfonate compound) that contains mostly water. The MSDS for Merox catalyst indicates that none of the ingredients in the catalyst has components that are classified or regulated by OSHA or by the United States National Toxicology Program (NTP). However, all of the ingredients in the catalyst are registered on the Toxic Substances Control Act (TSCA) Chemical Substance Inventory. Cobalt compounds are also specified as toxic chemicals under SARA Section 313 and may be subject to the Toxic Release Inventory (TRI) reporting requirements under 40 CFR 372. In addition, cobalt compounds are regulated pursuant to the State of California's Proposition 65 noticing requirements. Cobalt and cobalt compounds are not regulated by BAAQMD Regulation 2-5 or CalARP. The NFPA has not assigned a rating for Merox catalyst. Finally, Merox catalyst is not listed in the U.S. EPA's RCRA regulations because it does not possess any of the four identifying characteristics of hazardous waste (e.g., ignitability, corrosivity, reactivity or toxicity).

Implementing FGT modifications at affected refineries by installing Merox treatment systems is not expected to change the hazards profile of the affected units because Merox is not regulated as a hazardous substance. Thus, based on the preceding analysis, the hazards and hazardous materials impacts relative to the use of Merox are expected to be less than significant. Therefore, mitigation measures are not required.

#### **3.4.4.5 Selective Oxidation Catalyst**

Affected refinery operators may also consider replacing an existing catalytic emission reduction system with a selective oxidation catalyst system to treat flue gas from a SRU/TGU. Selective oxidation catalysts, like the product manufactured by EmeraChem (a proprietary catalytic gas treatment called selective oxidation catalyst "ESx"), are typically proprietary products that usually consist of a platinum- and titanium-based catalyst that is manufactured in module form. The modules consist of six inch-by-six inch coated ceramic blocks that are stacked in a fixed bed. The number of blocks that are needed depends on the amount of exhaust gas being treated and the amount of sulfur in the exhaust. The selective oxidation catalyst acts as a sulfur trap and is continuously regenerated. At the end of its useful life, the spent catalyst modules are replaced with fresh modules. The precious metals in the spent catalyst are reclaimed from the modules

and the remaining material is crushed and then recycled or disposed of in a landfill as non-hazardous waste. The NFPA has not assigned a rating for the EmeraChem's catalyst, but the MSDS for product indicates that it is nonhazardous according to the definition for "health hazard" and "physical hazard" provided in the OSHA Hazard Communication Law (29 CFR Part 1910).

Based on the above information, use of selective oxidation catalyst would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds. Therefore, potential hazards and hazardous materials impacts from increased usage of selective oxidation catalysts would be less than significant. Therefore, mitigation measures are not required.

#### **3.4.4.6 SO<sub>x</sub> Reducing Additives**

Operation of FCCUs is reliant on a catalyst, sometimes referred to as a "base catalyst" or an "equilibrium catalyst" in order to function. FCCU operators may also mix in additives (also catalysts) to change the composition of the flue gas to reduce emissions such as NO<sub>x</sub> and SO<sub>x</sub>.

The amount of SO<sub>x</sub> reducing additives introduced into each FCCU varies from unit to unit, depends on the inlet concentration of SO<sub>2</sub>, and is typically a percentage of the fresh base catalyst addition rate, which can range between five and 10 weight percent, but can go as high as 20 weight percent for handling SO<sub>x</sub> emission spikes. As with the base catalyst, eventually the SO<sub>x</sub> reducing additives cannot be regenerated and as such, need to be replaced with a fresh supply. The constant replenishment of base catalyst and SO<sub>x</sub> reducing additives means a constant generation of solid waste in the form of catalyst fines.

SO<sub>x</sub> reducing additives are made up of a mixture of metal oxide compounds such as aluminum oxide, magnesium oxide, cerium oxide, ceric oxide, magnesium aluminate, magnesium vanadate, cerium vanadium oxide, calcium aluminate, and ferric oxide. There are two main manufacturers of SO<sub>x</sub> reducing additives for FCCUs: Grace (formerly Grace Davison) and Intercat. Grace manufactures a product called "Super DeSO<sub>x</sub>" and Intercat's products are called "SO<sub>x</sub>Getter" and "Super SO<sub>x</sub>Getter." While these products vary from each other, in general, they are similar in composition to FCCU "base catalyst" in that they are made of metal oxide compounds and that they are compatible with SO<sub>x</sub> reducing additives. Located on the MSDS for Intercat's SO<sub>x</sub> reducing additives (e.g., "SO<sub>x</sub>Getter" and "Super SO<sub>x</sub>Getter"), the hazards ratings are as follows: health is rated 1 (slightly hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none). Similarly, the hazard ratings for Grace's "Super DESOX" additive re: health is rated 2 (moderately hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none). Therefore, hazards and hazardous materials impacts due to the use of SO<sub>x</sub> reducing additives is expected to be less than significant. As a result, mitigation measures are not required.

### **3.4.4.7 Wet Gas Scrubber**

#### **3.4.4.7.1 Caustic**

For any operators at potentially affected refineries who choose to install a WGS, hazardous materials may be needed to operate the WGSs depending on the source category. Caustic is a key ingredient needed for the operation of a WGS; it is the most widely used substance for several SO<sub>x</sub> control applications spanning multiple equipment/source categories. While there are several types of caustic solutions that can be used in WGS operations, caustic made from sodium hydroxide (NaOH) is most commonly used for WGSs for FCCUs and coke calciners.

**NAOH:** NaOH, used as caustic in a WGS, is a toxic air contaminant; and is also a noncancerous but acutely hazardous substance. Located on the MSDS for NaOH (50 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous, flammability is rated 0 (none), and reactivity is rated 1 (slightly hazardous). Use of NaOH caustic in a WGS would most likely occur at refineries that already use and store NAOH caustic for other purposes. Otherwise, the refinery operator would need to construct a new NAOH caustic storage tank and ancillary piping and other associated equipment. Since Regulation 12-16 does not specify what SO<sub>x</sub> emission sources would need to be controlled, it is likely that SO<sub>x</sub> control technologies that do not require building a new NaOH storage tank would be used.

**Soda Ash:** For WGSs that may be installed to control SO<sub>x</sub> from SRU/TGUs, the caustic used in the WGS may be made from soda ash, instead of NaOH. Soda ash is the common name for sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>), a non-toxic, non-cancerous, and non-hazardous substance. Located on the MSDS for Na<sub>2</sub>CO<sub>3</sub>, the hazards ratings are as follows: health is rated 2 (moderate), flammability is rated 0 (none) and reactivity is rated 0 (none).

Based on the above information, additional use of caustic in a WGS would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds. Therefore, potential hazards and hazardous materials impacts from increased usage of caustic in a WGS would be less than significant. As a result, mitigation measures are not required.

### **3.4.4.8 Releases During Transport**

#### **3.4.4.8.1 Selective Oxidation Catalyst**

A typical SRU/TGU system is not expected to require more than several hundred pounds of catalyst modules per year. As a result, delivery of catalyst modules can be accomplished in one truck trip. Based on their chemical properties, sulfur oxidation catalysts are not expected to pose significant adverse health or physical hazard impacts during use. Similarly, significant adverse hazards and hazardous materials impacts during use or transport of new catalysts to a refinery or transport of spent catalysts for recycling are expected to be less than significant because of they do not pose adverse

health or physical hazard impacts and, in the event of an accidental release, the modules would be easily contained and cleaned up. Therefore, mitigation measures are not required.

#### 3.4.4.8.2 Wet Gas Scrubber

Installation of a WGS would require deliveries of fresh caustic, either NaOH or soda ash. If an accidental release of caustic during transport occurs, potentially significant adverse hazards or hazardous materials impacts may be generated.

**NaOH:** Deliveries of NaOH (50 percent by weight) are typically made by tanker truck via public roads. The maximum capacity of one NaOH tanker truck is approximately 6,000 gallons. The projected consumption rates of NaOH are assumed to range from approximately 160 tons per year (T/Y) (0.44 tons per day (T/D)) to 1,228 T/Y (3.37 T/D) based on an analysis of WGS for refineries in southern California (SCAQMD, 2008). Based on worst-case assumptions, an affected refinery would need up to an additional 32 truck trips of NaOH caustic per year<sup>2</sup>. Although some of the affected refineries currently receive NaOH caustic, it is likely that they receive shipments periodically throughout the year rather than on a daily basis. Therefore, it is unlikely that an affected refinery would require one delivery per day in addition to any existing deliveries of NaOH caustic, instead it is likely that NaOH deliveries would occur on more days per year. Based on the assumptions of this analysis, because any affected refineries are assumed to be using and storing NaOH caustic and, thus, already receive periodic truck shipments of NaOH caustic, in the event of an accidental release during transport, the consequences of an accidental release would be unchanged compared to existing consequences. Finally, any operators of trucks that transport hazardous materials by public highway are required to comply with requirements described in 49 CFR §§ 173 and 177. In conclusion, hazardous materials impacts during the transport of NaOH caustic are considered to be less than significant.

**Soda Ash:** Additional soda ash, catalyst and SO<sub>x</sub> reducing additives could be delivered to some of the affected refineries in the future, but no increase in transportation hazards is expected as none of these materials are considered to be hazardous.

Based on the above information, accidental releases of caustic during transport would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds. Therefore, potential hazards and hazardous materials impacts from transporting caustic would be less than significant. As a result, mitigation measures are not required.

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<sup>2</sup> Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, 1,228 T/Y NaOH x 2,000 lbs/ ton = 2,465,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 192,000 gal/year x 1 truck/6,000 gallons = 32 trucks/year

### **3.4.4.9 Conclusion**

Installation of most types of air pollution control equipment is not expected to cause or contribute to significant adverse hazard impacts, with exception of baghouses or dry ESPs. As a result, feasible mitigation measures pursuant to CEQA Guidelines §15126.4 have been identified and are described in the following section.

### **3.4.5 MITIGATION MEASURES**

#### **3.4.5.1 Baghouses**

To reduce potential fire or explosion impacts from baghouses, the following mitigation measures are required.

- HHM-1 Maintain a comprehensive dust control program, with hazard dust inspections, testing, housekeeping, and control initiatives.
- HHM-2 Ground the filter elements using grounding wires, rods, etc., to prevent sparks that could be generated during cleaning.
- HHM-3 Install additional explosion rupture panels and vent outdoors
- HHM-4 If the collector filters are to be replaced the first procedure is to remove as much flammable or explosive dusts from the filters as possible. Reverse the exhaust fan's direction to maintain a low flow and prevent dust from returning to the hood. Clean the collector one section at a time allowing time for the dust to settle into the collection hopper. After several complete cleaning cycles a large portion of the dust will be ejected, which is expected to lower the exposure of the worker in handling the filter elements.
- HHM-5 Perform all hot work (welding, acetylene cutting, grinding, etc.) away from the collector, if possible.
- HHM-6 Ensure that power tools and impact hand tools (such as hammers, chippers, etc.) used by maintenance personnel that could present a sparking hazard are not used in high dust concentrations. When such work is being performed on the structure itself, make certain the dust concentrations within the enclosure are well below combustible levels.
- HHM-7 Ensure adherence to National Fire Protection Agency (NFPA) standards including, but not limited to, NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (classified) Locations for Electrical Installations in Chemical Process Areas

Implementing the above mitigation measures is expected to ensure that hazard and hazardous materials impacts would not exceed any applicable hazards and hazardous



materials significance thresholds, therefore, hazards and hazardous materials impacts from baghouses are concluded to be less than significant.

#### **3.4.5.2 Dry Electrostatic Precipitators**

Research of dry ESPs over the last 20 years has shown that this type of air pollution control equipment is generally safe to use. However, to ensure that potential fire and explosion risks are less than significant, the following safety mitigation measures have been identified.

HHM-8 Fire and explosion risks can be reduced by equipping dry ESPs with CO sensors that send a signal to a safety system to stop the process when CO concentrations exceed the critical limit. This solution reduces the risk dramatically.

HHM-9 Modern digital electronic controls shall be used to automate this process to assure the dry ESP operates at peak performance levels at all times.

HHM-10 The bottom and top of each wire should be covered with shrouds to help minimize sparking and metal erosion at these points.

HHM-11 To further reduce fire and explosion hazards, affected refinery operators shall establish the inspection frequency of all dry ESP components through a formal in-house maintenance procedure. Vendors' recommendations for an inspection schedule shall be followed and shall include at a minimum, the following procedures.

Daily: On a daily basis operation of hoppers and ash removal system should be checked; the control room ventilation system should be examined; any abnormal arcing in the ESP enclosure and ducts (typically caused by broken wires, which may swing freely causing shorting between discharge and collector electrodes) should be investigated; and electrodes should be checked.

Weekly: Air filters should be checked and cleaned weekly or more frequently.

Semiannually: On a semiannual basis the operator should check the exterior for visual signs of deterioration, and abnormal vibration, noise, or leaks.

Implementing the above mitigation measures is expected to ensure that hazard and hazardous materials impacts would not exceed any applicable hazards and hazardous materials significance thresholds, therefore, hazards and hazardous materials impacts from dry ESPs are concluded to be less than significant.

### **3.4.5.3 Remaining Impacts**

Implementing mitigation measures identified in Subsections 3.4.4.1 and 3.4.4.2 are expected to reduce significant adverse hazards and hazardous materials to less than the applicable hazards and hazardous materials significance thresholds. Therefore, overall hazards and hazardous materials impacts are concluded to be less than significant.

### **3.4.6 CUMULATIVE IMPACTS**

As concluded in the above hazards and hazardous materials analysis, installation of most types of air pollution control equipment, if required in the future, is not expected to cause or contribute to significant adverse hazard impacts, with the exception of baghouses or dry ESPs. As a result, feasible mitigation measures pursuant to CEQA Guidelines §15126.4 have been identified and were described. Implementing the mitigation measures identified in Sections 3.4.5.1 and 3.4.5.2 is expected to reduce significant adverse hazards and hazardous materials impacts to less than the applicable hazards and hazardous materials significance thresholds. Therefore, overall hazards and hazardous materials impacts, including accidental releases of hazardous materials during transport, were concluded to be less than significant. Because hazards and hazardous materials impacts do not exceed the applicable hazards and hazardous materials significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative hazards and hazardous materials impacts.

## **3.5 HYDROLOGY AND WATER QUALITY**

The NOP/IS (see Appendix A) determined the hydrology and water quality impacts of proposed new rules were potentially significant. As discussed below, potential cumulative impacts of hydrology and water quality are evaluated in Chapter 3.5 of this EIR.

### **3.5.1 ENVIRONMENTAL SETTING**

The San Francisco Bay Delta system is comprised of the convergence of the Sacramento and San Joaquin Rivers which receive runoff from approximately 40 percent of the land in California (60,000 square miles) and 47 percent of the State's total stream flow through the Carquinez Strait and San Pablo Bay. More than 90 percent of runoff occurs during the winter and spring months from rainstorms and snow melt. San Francisco Bay encompasses approximately 1,600 square miles and is surrounded by the nine Bay Area counties. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest subbasins include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles). The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands. The salinity of the water varies widely as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the Central Bay can vary from near oceanic levels to one-quarter as much, depending on the volume of freshwater runoff.

#### **3.5.1.1 Surface Waters**

Surface waters in the Bay Area include freshwater rivers and streams, coastal waters, and estuarine waters. Many of the original drainages toward the San Francisco Bay have been channelized and put underground due to urbanization, though a few remain. Estuarine waters include the San Francisco Bay Delta from the Golden Gate to the Sacramento and San Joaquin Rivers, and the lower reaches of various streams that flow directly into the Bay, such as the Napa and Petaluma Rivers in the North Bay and the Coyote and San Francisquito Creeks in the South Bay.

#### **3.5.1.2 Groundwater**

A groundwater basin is an area underlain by permeable materials capable of storing a significant amount of water. Groundwater basins are closely linked to local surface waters. As water flows from the hills toward the Bay, it percolates through permeable soils into the groundwater basins. The nine-county Bay Area contains a total of 28 groundwater basins. The ten primary groundwater basins are the Petaluma Valley, Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, and Santa Clara Valley basins. Groundwater in the Bay Area is used for numerous purposes, including municipal and

industrial water supply; however, groundwater use accounts for only about five percent of the total water usage.

### **3.5.1.3 Water Quality**

The quality of regional surface water and groundwater resources is affected by point-source and nonpoint-source discharges throughout individual watersheds. Regulated point sources such as wastewater treatment effluent discharges usually involve a single discharge into receiving waters. Nonpoint sources involve diffuse and nonspecific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Common nonpoint sources include urban runoff, agricultural runoff, resource extraction, and natural drainage. Pollutants that enter water bodies in urban runoff include oil and gasoline by-products from parking lots, streets, and freeways. In addition, impervious surfaces increase runoff quantities, taxing flow capacities of local flood control systems.

Regionally, stormwater runoff is estimated to contribute more heavy metals to the San Francisco Bay than direct municipal and industrial dischargers, as well as significant amounts of motor oil, paints, chemicals, debris, grease, and detergents. Runoff in storm drains may also include pesticides and herbicides from lawn care products and bacteria from animal waste. As point sources of pollution have been brought under control, the regulatory focus has shifted to nonpoint sources, particularly urban runoff.

### **3.5.1.4 Flood Hazards**

Annual rainfall in the Bay Area can range from eight to nine inches per year in the inland valleys to as much as 24 inches in the coastal hills and northern reaches of the region. Approximately 95 percent of annual precipitation in the Bay Area occurs between October and April, and flooding can occur in urban creeks and streams during more intense rainstorms. The U.S. Congress passed the National Flood Insurance Act in 1968 and the Flood Disaster Protection Act in 1973 to restrict certain types of development on floodplains and to provide for a national flood insurance program. The purpose of these acts is to reduce the need for large, publicly funded flood control structures and disaster relief. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program.

FEMA classifies flood hazard zones as follows:

- Zone A. Flood insurance rate zone that corresponds to the 100-year floodplain, determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

- Zone B, C, and X. Flood insurance rate zones that correspond to areas outside the limits of the 100-year floodplains; areas subject to 100-year sheet-flow flooding with average depth of less than 1 foot; areas of 100-year stream flooding where the contributing drainage area is less than one square mile; or areas protected from the 100-year flood by levees from the base flood. No base flood elevations or depths are shown within this zone.
- Zone D. Flood insurance rate zones that correspond to areas where there are possible but undetermined flood hazards. No analysis of flood hazards has been conducted. Mandatory flood insurance purchase requirements do not apply, but coverage is available. Flood insurance rates within Zone D are commensurate with the uncertainty of the flood hazard.

Many local jurisdictions regulate development within floodplains. Construction standards are established within local ordinances and planning elements to reduce flood impedance, safety risks, and property damage. Historic floods in the Bay Area have been devastating. In response, local flood control agencies and the U.S. Army Corps of Engineers have established extensive flood control projects, including dams and improved channels.

### **3.5.2 REGULATORY SETTING**

#### **3.5.2.1 Federal**

The major federal legislation governing the water quality aspects of the project is the Clean Water Act (CWA), as amended by the Water Quality Act of 1987. The objective of the act is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The CWA applies to discharges of pollutants into waters of the U.S. The following CWA sections are the most relevant to this analysis.

**Total Maximum Daily Load (TMDL) (§303d of the Clean Water Act):** California has identified waters that are polluted and need further attention to support their beneficial uses. These water bodies are listed pursuant to Clean Water Act Section 303(d), which requires states to identify these polluted waters. Specifically, §303(d) requires that each state identify water bodies or segments of water bodies that are “impaired” (i.e., not meeting one or more of the water quality standards established by the state). Approximately 500 waterbodies or segments have been listed in California. Once the water body or segment is listed, the state is required to establish a “Total Maximum Daily Load,” or TMDL, for the pollutant causing impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. Listing a water body as impaired does not necessarily suggest that the pollutants are at levels considered hazardous to humans or aquatic life or that the water body segment cannot support beneficial uses. The intent of the §303(d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for continued water quality degradation. TMDLs have yet to be

determined for most of the identified impaired water bodies. The Regional Water Quality Control Boards (RWQCBs) are responsible for developing strategies to attain compliance with the designated TMDLs. Many tributaries to and portions of San Francisco Bay and the Sacramento–San Joaquin Delta are listed as impaired water bodies on California’s §303(d) list and could be adversely affected by pollutants and other stressors that affect water quality.

**National Pollutant Discharge Elimination System (§402 of the Clean Water Act):** Section 402 of the Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into “navigable waters” of the United States. The RWQCBs monitor and enforce NPDES construction stormwater permitting in the Bay Area. The State Water Resource Control Board (SWRCB) administers the NPDES Permit Program through its General NPDES Permit. Construction activities of one acre or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). The project sponsor must submit a Notice of Intent (NOI) to the SWRCB in order to be covered by the General Permit prior to the beginning of construction. The General Construction Permit requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP), which must be prepared before construction begins. Components of SWPPPs typically include specifications for best management practices (BMPs) to be implemented during project construction for the purpose of minimizing the discharge of pollutants in stormwater from the construction area. In addition, a SWPPP includes measures to minimize the amount of pollutants in runoff after construction is completed, and identifies a plan to inspect and maintain project BMPs and facilities.

**State Water Quality Certification Program (§§401 and 404 of the Clean Water Act):** The RWQCBs coordinate the State Water Quality Certification Program, or §401 of the CWA. Under §401, states have the authority to review any permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction, to ensure that the actions are consistent with the state’s water quality requirements. This program is most often associated with §404 of the Clean Water Act, which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from “waters of the United States.” Additionally, §404 requires permits for activities that affect wetlands or alter hydrologic features, such as wetlands, rivers, or ephemeral creek beds.

### 3.5.2.2 State

**Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code):** The State of California’s Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California, including providing for the SWRCB to implement the CWA for California.

**California State Water Resources Control Board and Regional Water Quality Control Boards:** The SWRCB administers water rights, water pollution control, and

water quality functions throughout the state, while the RWQCBs conduct planning, permitting, and enforcement activities. The primary responsibility for the protection and enhancement of water quality in California has been assigned by the California legislature to the SWRCB and the nine RWQCBs. The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of State and federal laws and regulations. The RWQCBs adopt and implement water quality control plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems. The Bay Area encompasses portions of four separate RWQCBs: the North Coast Region, Central Coast Region, San Francisco Bay Region, and the Central Valley Region.

Both the SWRCB and U.S. EPA Region IX have been in the process of developing new water quality objectives and numeric criteria for toxic pollutants for California surface waters since 1994, when a State court overturned the SWRCB's water control plans containing water quality criteria for priority toxic pollutants. U.S. EPA's California Toxics Rule (CTR) was promulgated on May 18, 2000. The new criteria largely reflect the existing criteria contained in U.S. EPA's 304(a) Gold Book (1986) and its National Toxics Rule (NTR) adopted in December 1992 [57 Federal Register 60848], and those of earlier State plans (the Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan of April 1991, since rescinded). With the Final CTR, these federal criteria are legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the CWA.

**California Department of Fish and Game Code (§§1601–1603 [Streambed Alteration]):** Under §§1601-1603 of the Fish and Game Code, agencies are required to notify the California Department of Fish and Game (CDFG) prior to implementing any project that would divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake.

**Cobey-Alquist Flood Plain Management Act (Water Code §8400 et seq.):** The California Reclamation Board provides policy direction and coordination for the flood control efforts of state and local agencies along the Sacramento and San Joaquin Rivers and their tributaries in cooperation with USACE. It cooperates with various federal, State, and local government agencies in establishing, planning, constructing, operating, and maintaining floodcontrol works. The California Reclamation Board also exercises regulatory authority to maintain the integrity of the existing flood-control system and designated floodways by issuing permits for encroachments.

**California Coastal Act:** The California Coastal Commission was established by voter initiative in 1972 (Proposition 20) and made permanent by the legislature in 1976. The mission of the Commission, as the lead agency responsible for carrying out California's coastal management program, is to plan for and regulate development in the coastal zone consistent with the policies of the California Coastal Act. The Commission is also one of two designated state coastal management agencies established for the purpose of

administering the federal Coastal Zone Management Act in California. The Bay Conservation and Development Commission (BCDC) has authority over federal activities and federally licensed or assisted activities within San Francisco Bay, many of which are not otherwise subject to state control. The California Coastal Commission has the same authority over federal activities and federally licensed or assisted activities elsewhere in the California coastal zone. The basic goals of the state for the coastal zone are to:

- Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources;
- Assure orderly, balanced use and conservation of coastal zone resources, taking into account the social and economic needs of the people of the state;
- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resource conservation principles and constitutionally protected rights of private property owners;
- Assure priority for coastal-dependent and coastal-related development over other development on the coast; and
- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

### **3.5.2.3 Regional and Local**

**General Plan Safety Elements:** Government Code §65302, as amended (2007 Cal. Stat. 369) requires that on or after January 1, 2009, the updated safety elements of general plans must incorporate significantly enhanced geographic data, goals, and policies related to flood hazards. This enhanced assessment of flood hazards will include, but is not limited to: flood mapping information from multiple agencies including FEMA, the Army Corps of Engineers, the Office of Emergency Services, the Department of Water Resources, and any applicable regional dam, levee, or flood protection agencies; historical data on flooding; an inventory of existing and planned development (including transportation infrastructure) in flood zones; and new policies that comprehensively address existing and future flood risk in the planning area.

### **3.5.3 SIGNIFICANCE THRESHOLDS**

The proposed project impacts on hydrology and water quality would be considered significant if the following occurs:



**3.5.3.1 Water Demand**

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.

**3.5.3.2 Water Quality**

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of NPDES permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

**3.5.4 ENVIRONMENTAL IMPACTS**

**3.5.4.1 Potential Water Demand Impacts**

If any refineries are unable to demonstrate compliance with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub> or if additional TAC emission reductions are required as a result of updating the affected refineries' HRAs, it is expected that refinery operators would install new, or modify their existing air pollution control equipment in order to reduce emissions as required by Regulation 12-16. Additional water demand and wastewater generation impacts are expected to result from the operation of several of the possible control technologies that would most likely be used (see Table 3.5-1).

It is difficult to project water demand impacts from SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC control equipment for the following reasons. It is necessary to know the desired level of control to sufficiently reduce pollutant concentrations as appropriate. This in turn will determine the number of refinery units that would need to be retrofitted with air pollution control equipment. It also necessary to know the size of the refinery unit, which affects exhaust flow rate calculated as dry cubic feet per minute at standard conditions, another necessary variable used to calculate water demand. To maintain fresh solution, fresh water must be added periodically using either sump overflow or blowdown. In the sump overflow method fresh water is added through an adjustable flow meter at a continuous rate while the sump liquid overflows into the scrubber drain at a predetermined location. In the blowdown method, liquid is forced to drain by the recirculation pump. Regardless of the replenishing method used, it is necessary to know the flow rate necessary to maintain fresh solution. The rate of evaporation from the system must also be factored into the calculation of water demand impacts, which, at a minimum, requires knowing the

operating temperature and humidity. All of these factors require precise data from each refinery operator for each piece of equipment, which is currently not available.

**TABLE 3.5-1**

**Potential SO<sub>x</sub> and Particulate Control Technologies and Potential Water Use and Wastewater Generation During Equipment Operations**

<b>Potential Control Technology</b>	<b>Uses Water?</b>	<b>Significant?</b>	<b>Generates Wastewater?</b>	<b>Significant?</b>
Baghouse	No	No	No	No
Compressor	No	No	No	No
Cyclone	No	No	No	No
Diesel Oxidation Catalyst	No	No	No	No
Diesel Particulate Filter	No	No	No	No
Electrostatic Precipitator (Dry)	No	No	No	No
Electrostatic Precipitator (Wet)	Yes	No	Yes	No
Fuel Gas Treatment (Additive to Existing Amine System)	No	No	No	No
Fuel Gas Treatment (Merox Treatment)	No	No	No	No
Selective Oxidation Catalyst	No	No	No	No
SO <sub>x</sub> Reducing Additive	No	No	No	No
New Diesel ICEs	No	No	No	No
Wet Gas Scrubber	Yes	Yes	Yes	No

Demolition and construction activities to install air pollution control equipment have the potential to generate potential water demand and water quality impacts. For example, water is used during construction to reduce fugitive dust from any site preparation or grading activities. In addition, once equipment and ancillary piping is installed, water may be needed to perform hydrostatic testing to ensure that there are no leaks. Potential water demand and water quality impacts during potential future construction activities will be evaluated in the subsections below.

Table 3.5-1 shows air pollution control technologies that would provide the best opportunities for obtaining further reductions of SO<sub>2</sub>, PM<sub>2.5</sub>, and TAC emissions from refinery equipment or operations. As shown in Table 3.5-1, not all control technologies use water as part of the emission control process and, therefore, would not be expected to contribute to water demand or water quality impacts. These control technologies will not

be considered further in this analysis. Analyses of water demand and water quality impacts from control equipment that do use water as part of the control process are provided in the following subsections.

3.5.4.1.1 Construction

Dust Suppression

Installation of some types of relatively small air pollution control equipment, e.g., equipment, compressors, diesel oxidation catalysts, and diesel particulate filters are not expected to require site preparation activities because the equipment is generally not very large and could often be constructed onto existing refinery equipment or foundations. In the event that some site preparation is necessary for these types of control technologies, plots would be small in area, thus, requiring little water for fugitive dust control. Therefore, little or no water for dust suppression purposes is expected to be needed for construction of compressors, diesel oxidation catalysts, and diesel particulate filters, or the replacement of diesel ICEs with new diesel ICEs.

For large air pollution control equipment, e.g., ESPs, FGTs, WGSs, etc., site preparation activities requiring water for dust control would likely be necessary for relatively larger areas compared to compressors, diesel oxidation catalysts, and diesel particulate filters. For example, it is assumed that one water truck per affected refinery may be needed for dust suppression activities during the initial site preparation/earth moving to install large air pollution control equipment. One water truck used for dust control can hold approximately 6,000 gallons and it can be refilled over the course of the day if more than 6,000 gallons is needed. If one FGT unit is installed in response to future Regulation 12-16 emission reduction requirements, a typical system could require an area of approximately 6,000 square feet. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 12,000 gallons per day for one affected refinery. On windy days, it may be necessary to conduct a third water application. Thus, the total peak amount of water that could be used for dust suppression is approximately 18,000 gallons per facility per day. This analysis assumes that all water used for dust suppression activities is potable water. It is likely that some affected facilities have access to reclaimed water supplies, which could be used instead of potable water for dust suppression activities. Finally, once construction is complete, water demand for fugitive dust control activities would cease.

Even if all five affected refineries were to install one FGT with construction and, therefore, dust control activities occurring on the same days water demand for construction (90,000 gallons per day) would not exceed any applicable water demand significance threshold (262,820 gallons per day). Although assuming all five affected refineries would have the same level of fugitive dust control and water demand necessary to control fugitive dust is considered a conservative analysis, it is not likely to occur because other types of air pollution control technologies may be installed instead of FGT,

the lengths of time necessary to engineer and construct the equipment, would differ, refinery sites may already be paved, thus, reducing the amount of area necessary for site preparation, etc. Once construction is completed, additional demand for water would end. Therefore, water demand for dust control activities would be much less than 90,000 gallons per day and is concluded to be less than significant.

#### Hydrostatic Testing

During construction, some types of new equipment and piping may need additional water so hydrotesting of the new equipment and connective piping could be performed. Hydrotesting typically involves filling equipment or piping with water to check for leaks and does not require the use of potable water. Therefore, the water used for the hydrotesting equipment and associated piping would likely be comprised of refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater would eliminate the need for additional potable water supplies and would not increase the amount of wastewater generated by the Refinery. Therefore, water demand to perform hydrotesting of new equipment and piping, is not expected to exceed any applicable water demand significance thresholds and, therefore, is concluded to be less than significant.

In general, construction activities would have to be completed before hydrotesting could occur. As a result, it is not likely that water demand for fugitive dust control would overlap with water demand for hydrostatic testing. In conclusion, water demand impacts from dust control and hydrostatic testing activities would not cause or contribute to an exceedance of any applicable water demand significance thresholds and, therefore, are concluded to be less than significant.

#### 3.5.4.1.2 Operation

##### Wet Electrostatic Precipitator – Operation

Installation of wet ESPs would require additional water, which is used as part of the emission control process. Instead of clean water, it is likely that each affected refinery operator would utilize stripped sour water or similar existing treated waste process water from elsewhere within each facility. Because existing sources of refinery wastewater, e.g., stripped sour water or similar existing treated wastewater, could be used to operate a wet ESP, demand from installing new add-on control equipment would be minimal. In addition, as discussed in Subsection 3.5.4.2.2 below, wastewater from the wet ESP can be treated and recycled back to the wet ESP, further minimizing water demand impacts. Thus, the impacts of installing a wet ESP to comply with potential future emission reduction requirements pursuant to Regulation 12-16 on future water demand at an affected refinery are not expected to exceed any applicable water demand significance thresholds and, therefore, are concluded to be less than significant.

##### Wet Gas Scrubber – Operation

A WGS removes SO<sub>2</sub> from the flue gas by using a liquid solution that can be regenerated. As a result, installation of a WGS would result in an increased demand for water at an affected refinery. Based on an evaluation of water demand impacts from installing a WGS, compared to the overall existing water demand of a typical refinery, daily water demand impacts from installing a wet gas scrubber could increase by approximately 0.6 to approximately two percent (SCAQMD, 2010). Although small, depending on the size of the refinery and the number of refineries that install WGSs, this impact could exceed applicable water demand significance thresholds (262,820 gallons per day) and, therefore, is considered to be significant.

### Conclusion

Based upon the above considerations, water demand impacts from installing most types of air pollution control equipment that use water as part of the control process would not create water demand impacts that exceed the applicable water demand significance thresholds. However, it is likely that water demand impacts from installing a WGS would exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant.

### **3.5.4.2 Potential Water Quality Impacts**

Increased demand for water from the various SO<sub>x</sub> control technologies will be directly proportional to any increases in wastewater from affected refineries. However, as with quantifying water demand, there is insufficient information available to calculate the volumes of wastewater from SO<sub>x</sub> control equipment for the following reasons. First, not all of the additional water demand generated by installing SO<sub>x</sub> control equipment would ultimately be discharged as wastewater. In addition, some proportion of the increased water demand would be emitted as steam or would evaporate during the control process. To determine the evaporation rate it is necessary to know the operating temperature and humidity in the flue gas, which are currently unknown. In addition, wastewater discharge requirements under a facility's Industrial Wastewater Discharge Permit (IWDP) and current wastewater discharge rates need to be known. To the extent possible and based on available information, water quality impacts from air pollution control technologies that use water as part of the control process are evaluated in the following subsections

#### 3.5.4.2.1 Construction Activities

### Dust Suppression

Water used for dust suppression activities typically wets the top one to two inches of soil, evaporates and then forms a soil crust. As a result, this water does not flow into storm drains, sewers or other water collection systems and, therefore, water quality impacts from dust suppression activities are concluded to be less than significant.

### Hydrostatic Testing

As noted above, water used for the hydrotesting tanks and associated piping would likely be refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Water used for hydrostatic testing is not required to be comprised of potable water, but can instead be comprised of diverted wastewater such as cooling tower blowdown water or recycled wastewater, for example. Cooling tower blowdown is a wastewater stream that is typically discharged from affected refineries into the sewer system operated by the local sanitation district. Requirements regarding the constituents and amount of effluent that can be released by any industrial facility into a sanitary sewer system are limited under a refinery's Industrial Wastewater Discharge Permit (IWDP) from the local sanitation districts.

Using diverted wastewater would eliminate the need for additional potable water supplies to perform hydrostatic testing and would not increase the overall amount of wastewater generated by any affected refinery, but would vary the discharge rate during construction. While the wastewater is diverted, the total daily discharge rate of a refinery would decline. Upon completion of the hydrotesting for any new or modified equipment and piping, the hydrotest water would be returned the existing wastewater stream, treated as necessary, and then discharged to the sanitary sewer system. As a result, a refinery's discharge rate would temporarily increase until normal levels of effluent discharge are achieved. It is not expected that the temporary increase in effluent levels would exceed any existing wastewater discharge limits because refinery operators would be able to control the amount of effluent released each day.

Because hydrotest water would most likely be comprised of wastewater diverted from other refinery equipment or processes, it is not expected that hydrotest water would contribute to and exceedance of a refinery's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Therefore, changes to existing permit conditions would not likely be required and no violations of existing IWDPs, National Pollutant Discharge Elimination System permits, or other wastewater permit limits are expected. Therefore, water quality impacts during construction are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during construction are concluded to be less than significant.

Any wastewater generated from pressure testing is expected to flow to each affected facility's wastewater treatment or collection system and recycled or discharged after treatment with process wastewater. Thus, wastewater generation from pressure testing activities is not expected to affect groundwater quality. Further, the volume of wastewater that will be generated from pressure testing is expected to be minimal and within the capacity of each facility's wastewater treatment and collection systems.

#### 3.5.4.2.2 Operation

#### Wet ESPs

As noted above, an IWDP entitles each affected refinery to discharge wastewater. Since additional water would be needed as part of the wet ESP's pollution control process to comply with potential future requirements under Regulation 12-16, the proposed project could increase the wastewater generated by each affected refinery. However, instead of clean water, it is likely that each affected refinery operator would utilize stripped sour water or similar existing treated waste process water from elsewhere within each facility.

Wastewater from the wet ESP is collected and flows into a sump where it is typically treated and recycled to minimize water demand and wastewater generated from the equipment. Once recycled, wastewater generated by the wet ESP can also be returned to the wet ESP, which further reduces the total amount of water required for air pollution control, as well as the amount of wastewater discharged into the sewer system. For some types of wet ESPs recirculation of treated water to the ESP may approach 100 percent (U.S. EPA Fact Sheet).

If wastewater from the wet ESP is recycled before being discharged, depending on the volume of the potential wastewater discharged, if it is not within the percent variation allowed by the local sanitation districts, each affected refinery may need to apply for a revision to its IWDP or other wastewater discharge permits to accommodate any additional discharges to the sanitary sewer system. However, because existing sources of refinery wastewater, e.g., strip sour water or similar existing treated waste process water, could be used to operate a wet ESP, additional wastewater generated from installing new add-on control equipment would be minimal. Using existing sources of wastewater could actually result in a net decrease in the amount of wastewater discharged from the affected refinery. Thus, the impacts of installing a wet ESP to comply with potential future emission reduction requirements pursuant to Regulation 12-16 on each affected refinery's wastewater discharge volumes and their IWDPs are not expected to be exceed any applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

#### Wet Gas Scrubber

Water from the WGS can be treated and then recirculated back to the wet gas scrubber to be used again. Depending on a refinery's water treatment system, the rest of the effluent may be further treated and discharged to the sanitary sewer system. Depending on the type of WGS, some water may be lost as steam. For these reasons, it is not expected that WGS wastewater would contribute to and exceedance of a refinery's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Changes to existing permit conditions would not likely be required and no violations of existing IWDPs, NPDES permits, or other wastewater permit limits are expected. Therefore, water quality impacts from a WGS are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during operation are concluded to be less than significant.

### **3.5.4.3 Conclusion**

Based upon the above considerations, water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

### **3.5.5 MITIGATION MEASURES**

Because it was concluded that potential future water demand impacts from the proposed project during operation would be significant, mitigation measures for water demand are required. Therefore, for any affected refinery that installs an air pollution control technology that increases demand for water, the following water demand mitigation measures will apply.

HWQ-1 When air pollution control equipment is installed and water is required for its operation, the refinery operator is required to use recycled water, if available, to satisfy the water demand for the air pollution control equipment.

HWQ-2 In the event that recycled water cannot be delivered to the affected refinery, the refinery operator is required to submit a written declaration with the application for a Permit to Construct for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

In 2014, Governor Brown proclaimed a State of Emergency for California due to unprecedented drought conditions. New laws went into effect to begin regulating groundwater by adding restrictions on pumping in some areas to prevent aquifers from dwindling and wells from running dry. Water districts, in response to the drought, have also taken actions throughout the state such as: 1) asking for voluntary reductions; 2) imposing mandatory restrictions or declaring a local emergency; 3) imposing agricultural rationing; 4) imposing drought rates, surcharges and fines; 5) limiting new development and requiring water efficient landscaping; 6) implementing a conservation campaign; 7) stopping water pumping from various streams; and, 8) adjusting water contract allocations. In addition, water shortages have prompted cities to begin infrastructure improvements to secure future water supplies. Therefore, in spite of implementing the above water demand mitigation measures, operational water demand impacts remain significant.

### **3.5.5.2 Remaining Impacts**

With regard to water demand and water quality impacts during construction, it was concluded that impacts would be less than significant.

Because of the ongoing drought in California, in spite of implementing the mitigation measures identified above, water demand impacts during operation of the proposed project



remain significant, in part because there is currently no guarantee that reclaimed water will be available to all of the affected refineries. Therefore, the proposed project will remain significant after mitigation for water demand.

With regard to water quality during operation, it was concluded that impacts would be less than significant, so no mitigation measures are required.

### **3.5.6 CUMULATIVE IMPACTS**

In the above analyses of construction water demand and water quality it was concluded that impacts would be less than significant. Similarly, it was concluded that water quality impacts from the proposed project during operation would be less than significant. Therefore, because construction water quality and water demand impacts and operational water quality impacts were concluded to be less than significant, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative impacts these environmental topic areas.

In the above analysis of water demand impacts from the proposed project during operation it was concluded that installing a WGS has the potential to generate significant adverse operational water demand impacts. Therefore, water demand impacts during operation of the proposed project are considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)).

## **3.6 GROWTH INDUCING IMPACTS**

### **3.6.1 INTRODUCTION**

CEQA defines growth-inducing impacts as those impacts of a proposed project that “could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth” (CEQA Guidelines §15126.2(d)).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Facilitation of economic effects that could result in other activities that could significantly affect the environment;
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed Project modifications;
- Removal of obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

### **3.6.2 ECONOMIC AND POPULATION GROWTH, AND RELATED PUBLIC SERVICES**

The proposed rules would not directly foster economic or population growth or the construction of new housing in the Bay Area. The proposed rules may require construction of air pollution control equipment or measures within the confines of the existing refineries but would not be expected to involve new development outside of existing refineries. Therefore, it would not stimulate significant population growth, remove obstacles to population growth, or necessitate the construction of new community facilities that would lead to additional growth.

A project would directly induce growth if it would directly foster economic or population growth or the construction of new housing in the surrounding environment (e.g., if it would remove an obstacle to growth by expanding existing infrastructure). The proposed new rules would not remove barriers to population growth, as it involves no changes to General Plan, zoning ordinance, or related land use policy. The proposed new rules do not include the development of new housing or population-generating uses or

infrastructure that would directly encourage such uses. Therefore, proposed Regulations 12-15 and 12-16 would not directly trigger new residential development in the District. Further, the proposed rules would not result in an increase in local population, housing, or associated public services (e.g. fire, police, schools, recreation, and library facilities) since the proposed amendments would not result in an increase in workers or residents. Likewise, the proposed amendments would not create new demand for secondary services, including regional or specialty retail, restaurant or food delivery, recreation, or entertainment uses. As such, the proposed amendments would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

### **3.6.3 REMOVAL OF OBSTACLES TO GROWTH**

The proposed rules would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (i.e., new roadway access or utilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed rules would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

### **3.6.4 DEVELOPMENT OR ENCROACHMENTS INTO OPEN SPACE**

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The proposed rules may require additional air pollution control equipment and measures within the confines of existing refineries and existing industrial areas. New development outside of the refinery boundaries is not expected to occur. Therefore, the proposed amendments would not result in development within or encroachment into an open space area.

### **3.6.5 PRECEDENT SETTING ACTION**

The proposed new rules will require additional tracking of emissions and may require new emission limits on existing refineries. These types of activities are currently required of refineries and other industrial facilities to comply with various regulatory requirements. Emissions of TACs are currently required to be reported and HRAs are required to be prepared under AB2588 and the proposed regulations would reduce the acceptable health risk limits for refineries. However, the requirement for the preparation of emission inventories and HRAs already exists under state law. GHG emissions from refineries are required to be tracked and reported to CARB under the AB32 GHG requirements. Establishing thresholds, reporting emission inventories, conducting HRAs and additional monitoring requirements would not result in precedent-setting actions that might cause significant environmental impacts.

### **3.6.6 CONCLUSION**

The proposed new rules would not be considered growth-inducing, because they would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

### **3.7 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES**

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. As evaluated in the preceding portions of Chapter 3 of this EIR, the proposed amendments would result in potentially significant unavoidable impacts on air quality (criteria pollutants) during construction activities, greenhouse gas emissions during construction activities and on-going operations, and hydrology and water quality (water demand) during project operational activities.

### **3.8 ENVIRONMENTAL EFFECTS NOT FOUND TO BE SIGNIFICANT**

The environmental effects of proposed Rules 12-15 and 12-16 are identified and discussed in detail in the preceding portions of Chapter 3 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§15128). The following topics of analysis in this EIR were found to have no potentially significant adverse effects, after mitigation:

Air Quality (during project operation)  
Greenhouse Gases (during project operation)  
Hazardous and Hazardous Materials  
Water Quality

The following topics of analysis were found to have no potentially significant adverse effects in the Initial Study (see Appendix A):

Aesthetics	Noise
Agricultural and Forestry Resources	Population/Housing
Biological Resources	Public Services
Cultural Resources	Recreation
Geology/Soils	Transportation/Traffic
Land Use/Planning	Utilities and Service Systems
Mineral Resources	

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## **CHAPTER 4**

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### **ALTERNATIVES ANALYSIS**

Discussion of Alternatives  
Description of the Project Alternatives  
Environmental Impacts of Project Alternatives  
Conclusions



## 4.0 ALTERNATIVES ANALYSIS

### 4.1 DISCUSSION OF ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR the proposed project could result in potentially significant impacts to air quality and GHG emissions during construction and hydrology (water demand) during project operation. Therefore, alternatives should focus on alternatives to avoid or minimize these potentially significant impacts.

The objectives of the proposed amendments are as follows:

- Accurately and consistently characterize emissions of all pollutants (criteria, toxic, and greenhouse gases) from refinery-related emissions sources in an on-going basis to determine if there is room for improvement;
- Determine if significant changes to the crude slate (such as the refining of heavier and/or more sour crude oil) result in increased emissions of air pollutants.
- Ensure refineries comply with the ambient air quality standards for SO<sub>2</sub> and PM<sub>2.5</sub>;
- Determine the energy efficiency of the refineries;
- Determine the level of toxic exposure and risk refineries pose to the residents of nearby communities;
- Ensure refinery toxic emissions do not pose an unacceptable health risk to the residents of their nearby communities; and
- Provide information to the public on refinery emissions, crude slates, and health risk impacts.

Chapter 4 provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA guidelines, alternatives should include feasible measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.



In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination. Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts.

The possible alternatives to the proposed amendments are limited by the nature of the project. The amendments are designed to track emissions from refineries, determine the impact of crude oil composition on refineries emissions, minimize emissions of SO<sub>2</sub> and PM<sub>2.5</sub>, update HRAs, and minimize health risks associated with TAC emissions. If the District fails to adopt these regulations, portions of the rules could be implemented under other requirements, e.g., AB2588.

## **4.2 DESCRIPTION OF THE PROJECT ALTERNATIVES**

### **4.2.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE**

CEQA Guidelines §15126.6 (e) requires evaluation of a “No Project Alternative”. Under the “No Project Alternative,” the proposed new rules would not be adopted and the refineries would continue to operate under the existing rules and requirements. Under the No Project Alternative, Regulation 12-15 and 12-16 would not be adopted although portions of the regulations could be implemented under other regulatory programs. Regulation 12-15, the Tracking Rule, would not be implemented and the rule would not require the development of consistent annual emissions inventories, preparation of a PREP, report on the characteristics of crude and pre-processed feedstocks processed at the refinery, updated HRA, energy audits, or installation of fence-line and community air monitoring systems. Existing BAAQMD rules require the preparation of annual emission inventories for annual emission fee reports. Also, updated HRA can be required under the AB2588 Toxic Hot Spots regulations. So portions of Regulation 12-15 could be implemented without the new rule. However, there would be no requirement to prepare a PREP, to report on crude oil characteristics, to prepare Energy Audits for the BAAQMD, or establish fence-line or community air monitoring systems.

Under the No Project Alternative, the District would not set maximum allowable limits on PM<sub>2.5</sub> or SO<sub>2</sub> emissions, would not require demonstration of compliance with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub>, and would not implement additional health risk and risk reductions requirements. The AB2588 requirements would still apply to refineries and refineries could be required to submit a revised AB2588 HRA, although the higher risk limits would remain in effect.

### **4.2.2 ALTERNATIVE 2 – IMPLEMENT REGULATION 12-15, TRACKING RULE ONLY**

Alternative 2 would adopt Regulation 12-15, the Tracking Rule only. Under this alternative Regulation 12-16 would be eliminated so that maximum allowable limits on SO<sub>2</sub> and PM<sub>2.5</sub> would not occur, there would not be a requirement to demonstrate compliance with the NAAQS for SO<sub>2</sub> and PM<sub>2.5</sub>, and there would be no reduction in the risk management thresholds. The AB2588 requirements would still apply to refineries and refineries could be required to submit a revised AB2588 HRA, although the higher risk limits would remain in effect. Under existing AB2588 requirements mandatory risk reductions are required when the facility wide cancer risk is 100 in one million. Regulation 12-16 would require mandatory risk reductions if a facility wide cancer risk exceeds 25 in one million. Therefore, the allowable health risks would be higher under Alternative 2.

Under Alternative 2, Regulation 12-16 could be considered at a later date, after review of data collected under Regulation 12-15, which would demonstrate the need for further emission reductions.

### **4.3 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES**

#### **4.3.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE**

##### **4.3.1.1 Air Quality**

Under Alternative 1, Regulation 12-15 and 12-16 would not be implemented. There would be no requirement for additional emission inventories, air monitoring, recordkeeping, reporting of crude slate characteristics, energy audits, or emission reductions. Therefore, construction activities associated with installation of additional air pollution control equipment would be eliminated. The construction activities associated with large air pollution control equipment, e.g., WGS, are potentially significant and this impact would be avoided under the No Project Alternative.

The operational air quality impacts associated with the proposed project were determined to be less than significant and the operational emissions would also be eliminated under Alternative 1. The potential beneficial impacts of the proposed project associated with additional emission reductions of SO<sub>2</sub>, PM<sub>2.5</sub>, and TACs would also be eliminated under Alternative 1. Since the need for emission reductions has not yet been determined, the amount of emissions reductions that would not occur under Alternative 1 is unknown. Therefore, the operational emissions associated with the No Project Alternative would be less than significant.

##### **4.3.1.2 GHG Emissions**

Under Alternative 1, Regulation 12-15 and 12-16 would not be implemented. There would be no requirement for additional emission inventories, air monitoring, recordkeeping, reporting of crude slate characteristics, energy audits, or emission

reductions. Therefore, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. The GHG emissions associated with the proposed project were determined to be potentially significant for GHG emissions during construction activities and less than significant for operational emissions.

Under Alternative 1 there would be no additional construction and operational activities at the refineries and GHG emissions associated with implementation of Regulation 12-15 and 12-16 would be eliminated. Therefore, GHG emissions associated with the project under Alternative 1 would be less than significant.

#### **4.3.1.3 Hazards and Hazardous Materials**

Under Alternative 1, Regulation 12-15 and 12-16 would not be implemented. There would be no requirement for additional emission inventories, air monitoring, recordkeeping, reporting of crude slate characteristics, energy audits, or emission reductions. Therefore, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. The hazards associated with the proposed project were determined to be potentially significant for the operations of baghouses and ESPs. Hazards impacts associated with the potential installation of this equipment were determined to be less than significant after mitigation.

Under Alternative 1 there would be no additional construction and operational activities at the refineries and hazards and the additional use of hazardous materials associated with implementation of Regulation 12-15 and 12-16 would be eliminated. Therefore, hazards and hazardous materials impacts associated with Alternative 1 would be less than significant.

#### **4.3.1.4 Hydrology and Water Quality**

Under Alternative 1, Regulation 12-15 and 12-16 would not be implemented. There would be no requirement for additional emission inventories, air monitoring, recordkeeping, reporting of crude slate characteristics, energy audits, or emission reductions. Therefore, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. Water demand impacts were determined to be potentially significant as the use of WGSs would potentially require a significant amount of water to operate. Water quality impacts were determined to be less than significant.

Under Alternative 1 there would be no additional construction and operational activities at the refineries and the additional water use and wastewater discharged associated with implementation of Regulation 12-15 and 12-16 would be eliminated. Therefore, hydrology and water quality impacts associated with Alternative 1 would be less than significant.

#### **4.3.2 ALTERNATIVE 2 – TRACKING RULE ONLY**

#### **4.3.2.1 Air Quality**

Under Alternative 2, Regulation 12-15 would be implemented. Regulation 12-16 would not be included in the current project but may be implemented at some time in the future. Under Alternative 2, the refineries would be required to develop consistent emission inventories, conduct air monitoring, report of crude slate characteristics, and complete energy audits. However, under Alternative 2, no additional emission reductions or health risk reduction measures would be implemented. Therefore, construction activities associated with installation of additional air pollution control equipment would be eliminated. The construction activities associated with large air pollution control equipment, e.g., WGS, are potentially significant and this impact would be avoided under Alternative 2.

The operational air quality impacts associated with the proposed project were determined to be less than significant and the operational emissions would also be eliminated under Alternative 2. The potential beneficial impacts of the proposed project associated with additional emission reductions of SO<sub>2</sub>, PM<sub>2.5</sub>, and TACs would also be eliminated under Alternative 2. Since the need for emission reductions has not yet been determined, the amount of emissions reductions that would not occur under Alternative 2 is unknown. Therefore, the operational emissions associated with Alternative 2 would be less than significant.

#### **4.3.2.2 GHG Emissions**

Under Alternative 2, Regulation 12-15 would be implemented. Regulation 12-16 would not be included in the current project but may be implemented at some time in the future. Under Alternative 2, the refineries would be required to develop emission inventories, conduct air monitoring, report of crude slate characteristics, and complete energy audits. However, under Alternative 2, there no additional emission reductions or health risk reduction measures would be implemented. Therefore, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. The GHG emissions associated with the proposed project were determined to be significant for construction activities and less than significant for operational activities.

Under Alternative 2 there would be no additional construction and operational activities at the refineries and GHG emissions associated with implementation of Regulation 12-16 would be eliminated. Therefore, GHG emissions associated with the Alternative 2 would be less than significant for both construction and operation.

#### **4.3.2.3 Hazards and Hazardous Materials**

Under Alternative 2, Regulation 12-15 would be implemented. Regulation 12-16 would not be included in the current project but may be implemented at some time in the future. Under Alternative 2, the refineries would be required to develop emission inventories,

conduct air monitoring, report of crude slate characteristics, and complete energy audits. However, under Alternative 2, there no additional emission reductions or health risk reduction measures would be implemented. Therefore, construction activities associated with installation of additional air pollution control equipment would be eliminated. The hazards associated with the proposed project were determined to be potentially significant for the operations of baghouses and ESPs. Hazards impacts associated with the potential installation of this equipment were determined to be less than significant after mitigation.

Under Alternative 2 there would be no additional construction and operational activities at the refineries and hazards and the additional use of hazardous materials associated with implementation of Regulation 12-16 would be eliminated. Therefore, hazards and hazardous materials impacts associated with Alternative 2 would be less than significant.

#### **4.3.1.4 Hydrology and Water Quality**

Under Alternative 2, the refineries would be required to develop emission inventories, conduct air monitoring, report of crude slate characteristics, and complete energy audits. However, under Alternative 2, there no additional emission reductions or health risk reduction measures would be implemented. Therefore, construction activities associated with installation of additional air pollution control equipment would be eliminated. Water demand impacts were determined to be potentially significant as the use of WGSs would potentially require a significant amount of water to operate. Water quality impacts were determined to be less than significant.

Under Alternative 2 there would be no additional construction and operational activities at the refineries and the additional water use and wastewater discharged associated with implementation of Regulation 12-16 would be eliminated. Therefore, hydrology and water quality impacts associated with Alternative 2 would be less than significant.

## **4.4 CONCLUSION**

The Alternative 1 - No Project Alternative would reduce the potentially significant impacts associated with construction criteria pollutant and GHG emissions and water demand associated with the potential installation of additional air pollution control equipment to less than significant. The potential beneficial impacts of the proposed project associated with additional emission reductions of SO<sub>2</sub>, PM<sub>2.5</sub>, and TACs would also be eliminated under Alternative 1. Since the need for emission reductions has not yet been determined, the amount of emissions reductions that would not occur under Alternative 1 is unknown. Further, Alternative 1 would not achieve any of the project objectives.

Alternative 2 would implement Regulation 12-15. Under Alternative 2, the refineries would be required to develop emission inventories, conduct air monitoring, report of crude slate characteristics, and complete energy audits. However, under Alternative 2, no

additional emission reductions or health risk reduction measures would be implemented. Alternative 2 would achieve the following project objectives:

- Track and monitor refinery emissions in the District using state of the art technology;
- Track crude oil and pre-processed feedstock composition processed at refineries in the District;
- Require the collection of energy efficiency information;
- Update Health Risk Assessments based on the most recent OEHHA Guidelines;
- Reduce health risks from refineries that exceed health risk threshold levels; (the existing health risk thresholds only as the new thresholds would not be adopted) and
- Provide information to the public on refinery emissions, crude slates, and health risk impacts.

Alternative 2 would not require NAAQS demonstrations for SO<sub>x</sub> and PM<sub>2.5</sub> and would not reduce the health risk from refineries that exceed the proposed health risk threshold levels.

## **4.5 COMPARISON OF ALTERNATIVES**

Pursuant to CEQA Guidelines §15126.6(d), an EIR should include sufficient information about each alternative to allow meaningful comparison with the proposed project. Section 15126.6(d) also recommends the use of a matrix to summarize the comparison. Table 4-1 provides this matrix comparison displaying the major characteristics and significant environmental effects of each alternative. Table 4-1 lists the alternatives considered in this EIR and how they compare to proposed project. Table 4.5-1 presents a matrix that lists the significant adverse impacts as well as the cumulative impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The table also ranks each section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another.

**TABLE 4.5-1  
COMPARISON OF ALTERNATIVES**

<b>ENVIRONMENTAL TOPIC</b>	<b>Proposed Project</b>	<b>Alternative 1 No Project Alternative</b>	<b>Alternative 2 Rule 12-15 Only</b>
<b>Air Quality</b>			
Construction Emissions	PS	NS(-)	NS(-)
Criteria Pollutants	NS	NS	NS
Toxic Air Contaminants	B	NS	NS
<b>GHG Emissions</b>			
Construction Emissions	PS	NS(-)	NS(-)
Operational Emissions	NS	NS(-)	NS(-)
Hazards and Hazardous Materials	MNS	NS(-)	NS(-)
<b>Hydrology and Water Quality</b>			
Water Demand	PS	NS(-)	NS(-)
Water Quality	NS	NS(-)	NS(-)

Notes:

- PS = Significant
- NS = Not Significant
- MNS = Mitigated Not Significant
- B = Beneficial
- (-) = Potential impacts are less than the proposed project.
- (+) = Potential impacts are greater than the proposed project.
- (=) = Potential impacts are approximately the same as the proposed project.
- (1) = The long-term benefits of the No Project Alternative are less than for the proposed project.

As shown in Table 4-1, Alternative 1 would reduce all of the potentially significant impacts to less than significant. However, Alternative 1 would not achieve any of the proposed project objectives. Alternative 2 would also reduce all of the potentially significant impacts and would achieve six of the eight project objectives. Since Alternative 2 would eliminate all of the potentially significant impacts and achieve most of the project objectives, it would be considered the environmentally superior alternative.

The proposed project would be considered the preferred alternative as it would achieve all of the objectives and potentially result in reduced overall emissions in the Air Basin, providing an improvement in air quality not provided by the other project alternatives.

## **CHAPTER 5**

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### **REFERENCES**

References  
Organizations and Persons Consulted  
    Organization  
    Individuals Consulted  
List of Environmental Impact Report Preparers





## 5.0 REFERENCES

### 5.1 REFERENCES

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## **5.2 ORGANIZATIONS AND PERSONS CONSULTED**

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the EIR. The following organizations and persons have provided input into this document.

Bay Area Air Quality Management District  
San Francisco, California

## **5.3 LIST OF ENVIRONMENTAL IMPACT REPORT PREPARERS**

Bay Area Air Quality Management District  
San Francisco, California

Environmental Audit, Inc.  
Placentia, California

CalEnviro Metrics, LLC  
Los Angeles, California

## **Appendix A**

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**NOTICE OF PREPARATION AND INITIAL STUDY**

**COMMENTS**

**RESPONSE TO COMMENTS**



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

## California Environmental Quality Act

### NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR ADOPTION OF PROPOSED BAAQMD REGULATION 12, RULE 15: PETROLEUM REFINING EMISSIONS TRACKING AND PROPOSED BAAQMD REGULATION 12, RULE 16: PETROLEUM REFINING EMISSIONS ANALYSIS, THRESHOLDS AND MITIGATION

Interested Agencies, Organizations and Individuals:

**Subject:** Notice is hereby given that the Bay Area Air Quality Management District (Bay Area AQMD or Air District) will be the lead agency and will prepare an Environmental Impact Report (EIR) in connection with the project described in this notice. This Notice of Preparation is being prepared pursuant to California Public Resources Code § 21080.4 and CEQA Guidelines Section 15082.

**Project Title:** Proposed BAAQMD Regulation 12, Rule 15: Petroleum Refining Emissions Tracking and Proposed BAAQMD Regulation 12, Rule 16: Petroleum Refining Emissions Analysis, Thresholds and Mitigation

**Project Location:** The rule will apply within the Bay Area AQMD, which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

**Project Description:** The Bay Area Air Quality Management District is proposing two new rules: Proposed Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (Rule 12-15) and Proposed Regulation 12, Rule 16: Petroleum Refining Emissions Analysis, Thresholds and Mitigation (Rule 12-16). Rule 12-15 is being proposed to put in place requirements to enhance the tracking of refinery emissions, determine crude composition over time, require development of emissions inventory, require additional air monitoring, and requiring refineries to updated Health Risk Assessments utilizing the latest methodology and health effects data. Rule 12-16 would use emissions information gathered under Rule 12-15 to establish trigger level emissions thresholds, require causal analysis if those emissions thresholds are exceeded, prepare enforceable Emission Reduction Plans to reduce air emissions, and conduct an audit if planned reductions are not sufficient to bring emissions back below trigger threshold levels.

**Probable Environmental Impacts:** A number of air quality rules and regulation that apply to refineries are enforced by the BAAQMD. These existing rules and regulations require: (1) air permits; (2) the use of best available control technology (BACT); (3) new source review for new emission sources and offsets for new emissions; (4) control of toxic air contaminants; (5) control of fugitive emission sources including storage tanks, equipment leaks, bulk loading, and wastewater separators; and (6) control of emissions from combustion sources, including process heaters, boilers, internal combustion engines, gas turbines, catalytic cracking and reforming units, and flares. Rule 12-15 would require recordkeeping and monitoring. However, Rule 12-16 could require the modification to refineries to further reduce emissions either through the installation of air pollution control equipment or changes in operations.

Although the primary effect of installing air pollution control equipment is to reduce emissions of a particular pollutant, e.g., VOCs, some types of control equipment have the potential to create secondary adverse air quality impacts, e.g., increased NO<sub>x</sub> emissions if VOC emissions are controlled through a combustion process (e.g., afterburner) or require additional energy to operate. Control measures aimed at reducing NO<sub>x</sub> from stationary sources may use ammonia for control (e.g., selective catalytic reduction). Ammonia use could result in increased ammonia emissions and, since ammonia is a precursor to particulate formation, increased particulate emissions. Because of the potential for secondary emissions from air pollution control equipment,

there is a potential that sensitive receptors could be exposed to increased pollutant concentrations, which may be significant.

Rules 12-16 could require the installation of additional air pollution control equipment or modify refinery operations. The proposed new rules could require new construction activities and the operation of new/modified refinery equipment. The goal of Rule 12-15 and 12-16 is to minimize overall refinery emissions, however, refinery modifications could result in the increased use of fuel for combustions sources (e.g., electricity, natural gas, or refinery fuel gas), potentially generating additional greenhouse gas emission impacts, which will be evaluated in the Draft EIR.

An environmental impact report is needed to evaluate the air quality impacts of the proposed regulation and to address any impacts that the Air District finds to be significant. Attached to this notice is an Initial Study. The Initial Study outlines the areas of potential environmental impact that will be further reviewed in the draft Environmental Impact Report.

**Response:** This notice provides information on the above project and provides you an opportunity to submit comments on potential environmental effects that should be considered in the EIR. If the proposed project has no bearing on you or your agency, no action on your part is necessary. Due to the time limits mandated by State law, your response must be sent at the earliest possible date but ***not later than 30 days*** after receipt of this notice. If you or your agency wishes to submit comments, they may be sent to Guy Gimlen, via the contact information below.

**Eric Stevenson, Director**  
**Technical Service Division**  
**Bay Area Air Quality Management District**  
**939 Ellis Street**  
**San Francisco, CA 94109**  
**Phone: (415) 749-4695 Fax: (415) 749-5082**  
**Email: [EStevenson@baaqmd.gov](mailto:EStevenson@baaqmd.gov)**  
**Date: February 23, 2015**



# CEQA NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

February 23, 2015

**TO:** INTERESTED PARTIES  
**FROM:** EXECUTIVE OFFICER / APCO  
**SUBJECT:** NOTICE OF PREPARATION OF A DRAFT  
ENVIRONMENTAL IMPACT REPORT

**PROJECT TITLE:** BAAQMD Regulation 12, Rule 15 (Petroleum Refining  
Emissions General Requirements); BAAQMD  
Regulation 12, Rule 16 (New Source Review)

In accordance with the California Environmental Quality Act (CEQA) (California Code of Regulations, Title 14, Sections 15082(a)), the Bay Area Air Quality Management District (District) will be the Lead Agency for the project identified above and described in the attached Initial Study. Through this Notice of Preparation (NOP), the Air District is soliciting information and your views on the scope of the environmental analysis for the proposed project. As detailed in the attached Initial Study, Air District staff has made a preliminary determination that the potential air quality, greenhouse gas, and hazard impacts of implementing the proposed Rule amendments required more detailed analyses in an Environmental Impact Report (EIR).

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Comments focusing on your area of expertise, your agency's area of jurisdiction, or issues relative to the environmental analysis should be addressed to Mr. Eric Stevenson at the address shown below, or sent by fax to (415) 749-4741, or by e-mail to [estevenson@baaqmd.gov](mailto:estevenson@baaqmd.gov). Comments must be received no later than **5:00 PM on Friday, March 27, 2015**. Please include the name and phone number of the contact person for your agency. Questions relative to the proposed Rules should be directed to Mr. Eric Stevenson (415) 749-4695, or by email to [estevenson@baaqmd.gov](mailto:estevenson@baaqmd.gov).

The following public workshops are scheduled for the proposed new Rule:

**Benicia**  
**Monday, March 16, 2015**  
**5:30 PM-7:00 PM**  
**Benicia Senior Center**  
**187 East L Street**

**Richmond**  
**Tuesday, March 17, 2015**  
**5:30 PM-7:00 PM**  
**Madeline F Whittlesey Community Room**  
**325 Civic Center Plaza**



**Martinez**  
**Wednesday, March 18, 2015**  
**5:30 PM- 7:00 PM**  
**Contra Costa County Chambers**  
**651 Pine Street**

**San Francisco\***  
**Friday, March 20, 2015**  
**10:30 AM- 12:00 PM**  
**Air District Board Room, 7<sup>th</sup> Floor**  
**939 Ellis Street**  
*\*Meeting will be webcast*

*Date:* February 23, 2015

*Signature:*   
Eric Stevenson, Director,  
*Technical Services Division*

## NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

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**Project Title:**

Proposed BAAQMD Regulation 12, Rule 15: Petroleum Refining Emissions Tracking and Proposed BAAQMD Regulation 12, Rule 16: Petroleum Refining Emissions Analysis, Thresholds and Mitigation

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**Project Location:**

The proposed rule amendments would apply five refineries within the District, which 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.

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**Description of Nature, Purpose, and Beneficiaries of Project:**

Regulation 12-15 is being proposed to put in place requirements to enhance the tracking of refinery emissions, determine crude composition over time, require development of emissions inventory, require additional air monitoring, and requiring refineries to updated Health Risk Assessments utilizing the latest methodology and health effects data. Regulation 12-16 would use emissions information gathered under Regulation 12-15 to establish trigger level emissions thresholds, require causal analysis if those emissions thresholds are exceeded, prepare enforceable Emission Reduction Plans to reduce air emissions, and conduct an audit if planned reductions are not sufficient to bring emissions back below trigger threshold levels.

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**Lead Agency:**

Bay Area Air Quality Management District

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**Initial Study and all Supporting Documentation are Available at:**

BAAQMD Headquarters

939 Ellis Street

San Francisco, CA 94109

Attn: Eric Stevenson at (415) 749-4689 or [estevenson@baaqmd.gov](mailto:estevenson@baaqmd.gov)

Or by accessing: <http://www.baaqmd.gov/Divisions/Planning-and-Research/Rule-Development/Rule-Workshops.aspx>

Or by Calling:

(415) 749-4695

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**Scheduled Workshop Dates:**

<p><b>Benicia</b> <b>Monday, March 16, 2015</b> <b>5:30 PM-7:00 PM</b> <b>Benicia Senior Center</b> <b>187 East L Street</b></p>	<p><b>Richmond</b> <b>Tuesday, March 17, 2015</b> <b>5:30 PM-7:00 PM</b> <b>Madeline F Whittlesey Community Room</b> <b>325 Civic Center Plaza</b></p>
<p><b>Martinez</b> <b>Wednesday, March 18, 2015</b> <b>5:30 PM- 7:00 PM</b> <b>Contra Costa County Chambers</b> <b>651 Pine Street</b></p>	<p><b>San Francisco*</b> <b>Friday, March 20, 2015</b> <b>10:30 AM- 12:00 PM</b> <b>Air District Board Room, 7<sup>th</sup> Floor</b> <b>939 Ellis Street</b> <i>*Meeting will be webcast</i></p>

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**The Notice of Preparation is provided through the following:**

- Office of Planning & Research, State Clearinghouse
- Newspaper
- Interested Parties
- BAAQMD Website
- BAAQMD Mailing List

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**Review Period:**

February 23, 2015 through March 25, 2015

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**Contact Person:**

Eric Stevenson

**Phone Number:**

(415) 749-4695

**E-Mail Address:**

estevenson@baaqmd.gov

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT**

**Initial Study for Proposed**

**BAAQMD Regulation 12-15: Petroleum Refinery  
Emissions Tracking**

**BAAQMD Regulation 12, Rule 16: Petroleum Refining  
Emissions Analysis, Thresholds and Mitigation**

**Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, California 94109**

**Contact: Eric Stevenson  
415-749-4695**

**Prepared by:**

**ENVIRONMENTAL AUDIT, INC.  
1000-A Ortega Way, Suite A  
Placentia, CA  
(714) 632-8521**

**February 2015**

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# **CHAPTER 1**

## **PROJECT DESCRIPTION**

Introduction

Agency Authority

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Project Description

## **1.0 PROJECT DESCRIPTION**

### **1.1 INTRODUCTION**

The Bay Area Air Quality Management District (BAAQMD or Air District) is proposing two new rules that would apply to petroleum refineries located in the San Francisco Bay Area. The titles of the proposed new rules are Regulation 12, Rule 15 (Rule 12-15): Petroleum Refining Emissions Tracking (herein “Tracking Rule”); and Regulation 12, Rule 16 (Rule 12-16): Petroleum Refining Emissions Analysis, Thresholds and Mitigation (herein “Mitigation Rule”).

Rule 12-15 is being proposed to put in place requirements to enhance the tracking of refinery emissions and crude composition over time. Tracking this information would allow the Air District to use emissions inventory data, crude oil information and air monitoring data to identify any potential relationship between emissions and crude oil quality. In addition, the rule would also require updated Health Risk Assessments (HRAs) be performed utilizing the latest methodology and health effects data to provide additional information regarding health risk from air emissions at refineries. Rule 12-16 would use emissions information gathered by the Tracking Rule to establish “trigger level” emissions thresholds and would require refineries to address significant increases in emissions due to, among other causes, changes in crude oil composition. The causal analysis required when emissions thresholds are exceeded would explain why the emissions increase occurred. Enforceable Emission Reduction Plans (ERPs) would commit the refineries to planned reductions. If planned reductions are not sufficient to bring emissions back below trigger level thresholds within the two years, an audit would be required to identify all feasible measures for emission reductions to bring emissions below the established threshold levels.

### **1.2 AGENCY AUTHORITY**

The California Environmental Quality Act (CEQA), Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. To fulfill the purpose and intent of CEQA, the BAAQMD is the lead agency for the proposed Regulation 12, Rule 15, and Regulation 12, Rule 16, and has prepared a Notice of Preparation of an Environmental Impact Report (EIR) and Initial Study (NOP/IS) to address the potential environmental impacts associated with the proposed new rules. The Lead Agency is the “public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment” (Public Resources Code § 21067). It was determined that the BAAQMD has the primary responsibility for supervising or approving the entire project as a whole and is the most appropriate public agency to act as lead agency (CEQA Guidelines § 15051(b)).

### **1.3 PROJECT LOCATION**

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District 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. 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 (see Figure 1-1).

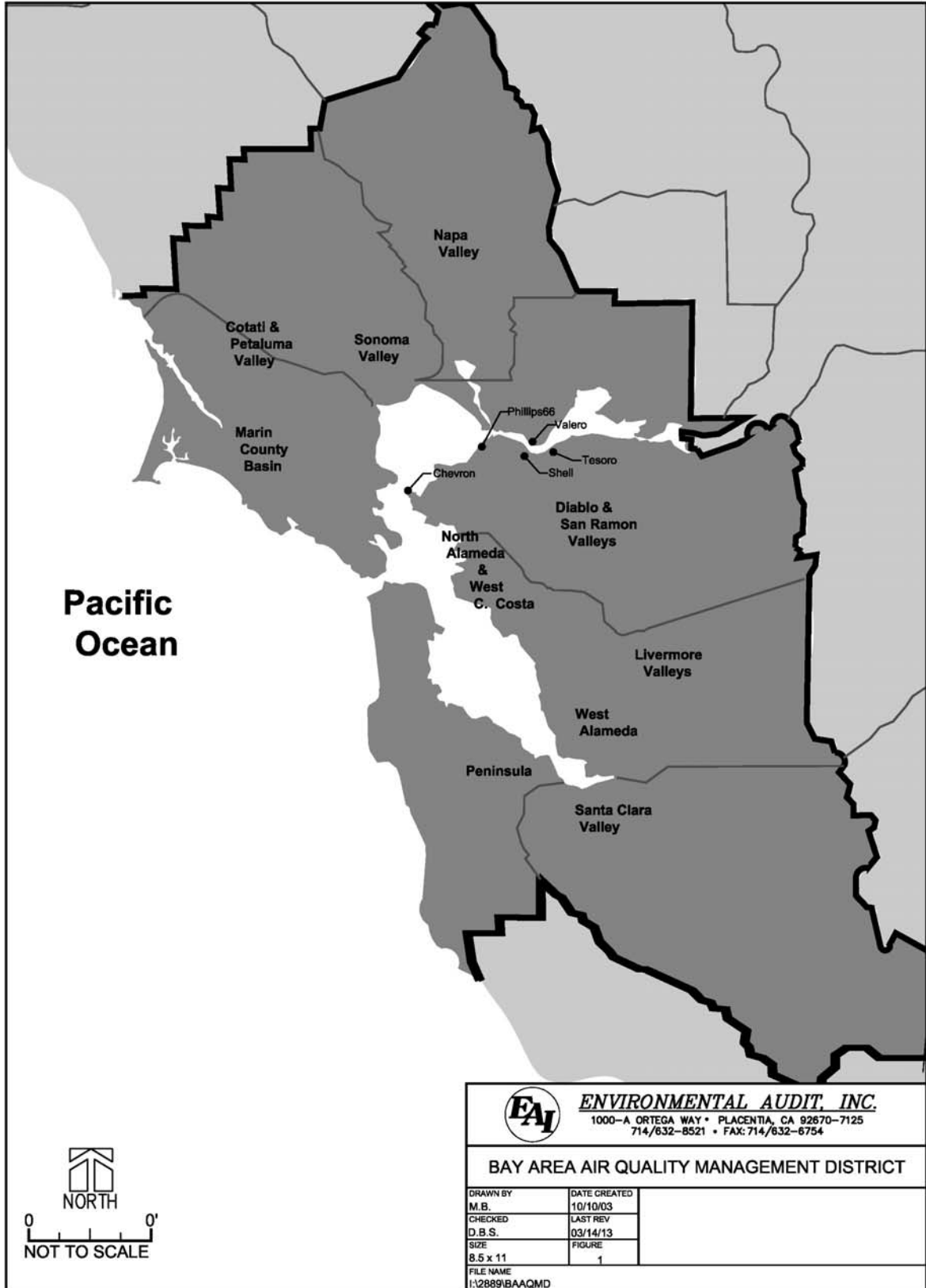
## 1.4 BACKGROUND

Currently five petroleum refineries are located in the Bay Area within the jurisdiction of the Air District:

- Chevron Products Company (Richmond),
- Phillips 66 Company – San Francisco Refinery (Rodeo),
- Shell Martinez Refinery (Martinez),
- Tesoro Refining and Marketing Company (Martinez), and
- Valero Refining Company – California (Benicia).

Petroleum refineries convert crude oil into a wide variety of refined products, including gasoline, aviation fuel, diesel and other fuel oils, lubricating oils, and feed stocks for the petrochemical industry. Crude oil consists of a complex mixture of hydrocarbon compounds with smaller amounts of impurities including sulfur, nitrogen, oxygen and metals (e.g., iron, copper, nickel, and vanadium). Crude oil that originates from different geographical locations may vary with respect to its composition, and is most often determined by the oils' density (light to heavy) and sulfur content (sweet to sour).





Air pollutants are categorized based on their properties, and the programs in which they are regulated. Air pollutants include: (1) criteria pollutants, (2) toxic air contaminants, and (3) greenhouse gases. Additional categories of air contaminants include odorous compounds and visible emissions.

Criteria pollutants are emissions for which Ambient Air Quality Standards (AAQS) have been set and include: (1) carbon monoxide (CO), (2) nitrogen dioxide (NO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>), (3) particulate matter (PM) in two size ranges -- diameter of 10 micrometers or less (PM<sub>10</sub>), and diameter of 2.5 micrometers or less (PM<sub>2.5</sub>), (4) volatile organic compounds (VOC), and (5) sulfur dioxide (SO<sub>2</sub>). Each of these criteria pollutants are emitted by petroleum refineries.

Toxic air contaminants (TACs) are emissions for which AAQS have generally not been established, but may result in human health risks. The state list of TACs currently includes approximately 190 separate chemical compounds, and groups of compounds. TACs emitted from petroleum refineries include volatile organic TACs, semi-volatile and non-volatile organic TACs, metallic TACs, and other inorganic TACs.

Greenhouse gases (GHGs) are emissions that include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and three groups of fluorinated compounds (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>)), and are the major anthropogenic GHGs. GHGs emitted from petroleum refineries include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

The proposed regulatory approach for Regulations 12-15 and 12-16 are summarized below and include the following basic elements.

### **Regulation 12, Rule 15**

- Report on-going annual emissions inventories of all regulated air pollutants based on upgraded methods, including emissions from cargo carriers,
- Develop a Petroleum Emissions Profile (PREP) based on three years of emissions inventory and require that on-going inventories include comparisons with the PREP,
- Report on-going crude oil characteristics with annual emissions inventories,
- Require an update of refinery Health Risk Assessments (HRAs) based on the most recent Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) guidelines, and
- Establish fence-line and community air monitoring systems.

## **Regulation 12, Rule 16**

- Establish emissions thresholds,
- Require a causal analysis if criteria pollutant, TAC and/or GHG emissions increases not due solely to crude oil throughput are above trigger level thresholds.
- Require the submission of an emission reduction plan for criteria pollutants and TACs to reduce emissions when trigger levels are exceeded.
- Require the submission of an emissions audit requiring implementation of all feasible measures if planned emission reductions will not fully mitigate emission increases within two years.
- Require updates to emission reduction plans if expected emissions reductions are not achieved in practice.

## **1.5 PROPOSED PROJECT DESCRIPTION**

The description of proposed Regulation 12, Rule 15 and Regulation 12, Rule 16 are provided below.

### **1.5.1 REGULATION 12, RULE 15**

#### **1.5.1.1 Administrative Procedures**

The proposed Tracking Rule would require refinery owner/operators to submit to the BAAQMD various reports and plans, subject to review by members of the public and other interested stakeholders. Comments received would be considered by Air District staff prior to taking final action to approve, revise, or disapprove the reports and plans. Commenters would be notified of the Air District's final actions, and approved reports and plans would be posted on the Air District's website.

It should be noted that California law specifies that "trade secrets" are not public records. While air pollutant emissions data and air monitoring data may not be considered trade secrets, many other types of information may be (e.g., production data used to calculate emissions data).

Section 12-15-411 of the proposed rule specifies that a refinery owner/operator may designate as confidential any information required to be submitted under the rule that is claimed to be exempt from public disclosure under the California Government Code. The owner/operator is required to provide a justification for this designation, and must submit a separate public copy of the document with the information that is designated "confidential" redacted.

### **1.5.1.2 Pollutant Coverage**

The proposed Tracking Rule would cover the three primary categories of regulated air pollutants: (1) Criteria pollutants emissions; (2) TAC emissions; and (3) GHG emissions. The definition of TAC provided in Section 12-15-220 of the proposed rule refers to the State TAC list and includes those State TACs that have a basis for the evaluation of health effects under guideline procedures adopted by OEHHA for the Air Toxics Hot Spots Program.

Unlike criteria pollutants and TACs, GHGs are not directly associated with localized or regional health risks, which is the primary issue that the new rule is intended to address. GHGs are included in the proposed rule to address climate change issues (which have a link to increasing air concentrations of ozone, a criteria pollutant that forms on hot summer days), and because measures to reduce GHG emissions typically result in co-benefits in terms of reducing criteria pollutant and TAC emissions.

Odororous and visible emissions are not specifically proposed to be covered by the new rule, although most of these pollutants are also included in one of the categories of regulated air pollutants that would be covered (e.g., hydrogen sulfide, which is the primary odororous compound emitted from refineries, is a covered TAC; visible emissions are typically fine particulate matter (PM<sub>2.5</sub>), a covered criteria pollutant).

### **1.5.1.3 Source Coverage**

The proposed Tracking Rule would apply to all air emissions from “stationary sources” at petroleum refineries. Stationary sources, as opposed to mobile sources such as trucks and other vehicles, are the sources over which the Air District has regulatory jurisdiction. However, there are instances where mobile sources become stationary sources, such as when ships and trains are unloading or loading products produced at the refinery, and thus should be included in the requirements of the rule. This concept is addressed in the definition of “emissions inventory” in Section 12-15-207.

The proposed Tracking Rule would apply to petroleum refinery operations whether or not these operations are owned or operated by different entities. For example, some Bay Area refineries include co-located hydrogen plants that are owned or operated by separate companies, but that provide hydrogen for refinery operations. Similar arrangements also exist for refinery terminal operations, and auxiliary facilities (e.g., cogeneration plants). The definition of “refinery owner/operator” provided in Section 12-15-215 of the proposed rule indicates that the refinery owner/operator is responsible for the submittal of required reports and plans that cover the entire refinery, including those that may be separately owned or operated. This is the same approach that is used in the implementation of BAAQMD Regulation 12, Rule 12: Flares at Petroleum Refineries (e.g., for the submittal of Flare Minimization Plans).

BAAQMD staff also believes there may be emissions changes caused by changes in the types and quantities of crude oil processed by a particular petroleum refinery over a period of time. As a result, the proposed rule requires that each refinery report its “crude slate” as defined in Section 12-15-206 that contains information regarding sulfur and nitrogen content, API gravity and total

acid number as described in Section 12-15-401.6. By gathering this information about crude oil fed into the refinery processes, the Air District intends to determine the relationship between the crude slate and emissions. Reporting the composition of the crude oil that is processed by the refinery along with total emissions from the refinery processes will assist in the development of any relationships that may exist between crude oil composition and overall facility emissions.

#### **1.5.1.4 Emissions Inventory Development**

Emissions inventories are used in a variety of air quality programs, and methodologies for establishing these inventories are provided in various publications. Depending on the specific type of source, and the specific type of air pollutant emitted, state-of-the-art emissions inventory techniques may involve continuous emission monitors, source-specific emission tests, general emission factors (i.e., representative values that relate the quantity of a pollutant emitted with an activity associated with the release of that pollutant), material balances, or empirical formulae. The term “emissions inventory” is defined in Section 12-15-207 of the proposed rule.

Due to the diversity of emissions inventory methodologies that exist, and the need to update these methodologies on an on-going basis due to improvements in scientific understanding and available data, Air District staff believes the Tracking Rule should not include detailed emissions inventory methodologies. As reflected in Section 12-15-409 of the proposed rule, the Air District staff would publish, and periodically update, emissions inventory guidelines for petroleum refineries that specify the methodology to be used for emissions inventories required under the rule. Section 12-15-601 indicates that emissions inventories submitted under the rule must be prepared following District-published guidelines.

The initial refinery emissions inventory guideline document has been developed concurrently with the development of the proposed new rule. That document refers heavily to other inventory methodology publications, including the refinery emissions protocol issued for the purpose of improving emissions inventories as collected through the U.S. EPA’s 2011 Information Collection Request (ICR) for the petroleum refining industry (Emission Estimation Protocol for Petroleum Refineries, Version 2.1.1, Final ICR Version, RTI International, May 2011).

The BAAQMD has used staff-published guideline documents in combination with other rules that have requirements based on detailed technical information that needs to be updated on an on-going basis. This includes the Air District’s BACT/TBACT Workbook and Permit Handbook (both used in Air District Rules 2-2 and 2-5), and Health Risk Screening Guidelines (used in Air District Rules 2-1 and 2-5).

#### **1.5.1.5 Emissions Inventories and Crude Slate Report**

The establishment of existing annual emissions inventories will provide the basis in the new rule for determining emissions variations that occur from each refinery year to year and will be used to develop a Petroleum Refinery Emissions Profile (PREP). In addition, each refinery would be required to provide information on the crude slate, as described above, that the Air District would use to examine potential relationships between emissions and crude input to the refinery. Each refinery would be required to prepare and submit an annual refinery emissions inventory

and crude slate report to the Air District as specified in Section 12-15-401 of the proposed rule. The public is provided an opportunity to provide input regarding emissions inventory and crude slate reports as described in Section 12-15-404.

### **1.5.1.6 Establishing Petroleum Refinery Emissions**

Emissions can fluctuate from year to year due to market forces or other factors not necessarily related to normal refinery operation. Multiple annual emissions inventories are required to develop a more complete understanding of emissions and help determine which sources might require additional emissions reductions. Under the proposed Regulations 12-15, each refinery would be required to prepare and submit to the Air District a PREP, as specified in Section 12-15-402. The PREP would include a summary of the average emission rate of each criteria pollutant, TAC and GHG that was emitted from each source and from the refinery overall.

Although refinery operations are more continuous and uniform than some other types of industries, year-to-year variations in emissions occur due to a variety of factors. Some of these factors include business cycles that affect the demand for products produced, and cyclical process unit maintenance turnarounds (which generally occur on different schedules at different refineries).

A variety of other factors may affect variations in year-to-year emissions from a refinery including the addition of emissions controls, equipment changes (e.g., replacements, modernizations, and expansions), accidents, compliance issues, changes in feed stocks used, and the mix of products produced due to business decisions. As a result of these fluctuations, staff believes a three year period should be used to define the PREP. The annual emissions inventories will be compared to the PREP to see variations of emissions from year to year and over time and will be compared to changes in crude slate to determine if crude composition changes have a major impact in emissions. The public would have an opportunity to provide input regarding emissions inventory and crude slate reports as described in Section 12-15-404.

### **1.5.1.7 Revising Petroleum Refinery Emissions Profiles**

In addition to specifying the quantity of emissions that occurred from the refinery during the three-year period for which the report is prepared, the on-going emissions inventory reports would also identify the changes in emissions that occurred relative to the PREP as described in Section 12-15-403. Revisions will indicate whether any observed changes in emissions have occurred. This provision would also cover potential expansions of the emissions inventory over time to address additional compounds that may be added to the OEHHA health effects values list, and will ensure that a uniform basis exists for determining changes in emissions over time. Any revisions to the PREP are required to be submitted no later than the date the emissions inventory affected by the changes in methodology is required.

### **1.5.1.8 Health Risk Assessments**

The BAAQMD uses a variety of tools to determine where health hazards may be occurring in the Bay Area, to assess the relative magnitude of these health hazards compared to other locations, and to determine how to best focus Air District resources in order to reduce these health hazards. HRAs are one of the tools that can be used to assess the relative magnitude of health hazards. HRAs are designed to quantify the potential health impacts to an individual receptor or community that may be occurring due to specific sources or facilities or that may occur in the future due to proposed projects or proposed changes at a facility. For the purposes of this rule, an HRA is defined in Section 12-15-210.

An HRA consists of four basic steps: 1) hazard identification; 2) exposure assessment; 3) dose response assessment; and 4) risk characterization. The Air District conducts HRAs using standardized methodologies for each of these steps. As indicated in Sections 12-15-210 and 12-15-602 of the proposed rule, HRAs will be prepared in accordance with the most recent guidelines adopted by the OEHHA. The Air District follows these OEHHA HRA Guidelines when conducting HRAs under the Air Toxic Hot Spots Program.

BAAQMD staff believes that new facility-wide HRAs should be performed including improved emission inventories, updated health effects values, and the most recent HRA methodologies. The proposed rule requires that each refinery conduct an HRA utilizing the most recent OEHHA HRA Guidelines along with more refined emissions inventories. This requirement is outlined in Section 12-15-405. The public would have an opportunity to review and comment on the HRA Modeling Protocol and the HRA, as described in Section 12-15-406.

### **1.5.1.9 Air Monitoring**

The proposed Tracking Rule would require the refinery owner/operator to prepare and submit to the Air District an air monitoring plan for establishing and operating a fence-line monitoring system and a community air monitoring system (see Section 12-15-407). The air monitoring plans would need to be prepared in accordance with air monitoring guidelines that are published by the Air District (see Sections 12-15-410 and 603).

The initial air monitoring guideline document was developed concurrently with the development of the proposed rule. Much of the information gathering for the guideline document is being completed under Action Item 3 of the Air District's Work Plan for Action Items Related to Accidental Releases from Industrial Facilities. Under this Action Item, Air District staff retained a contractor to create a report that identifies equipment and methodological options for monitoring systems. A panel of monitoring experts gathered from academia, industry, the community, and other government agencies then discussed and weighed the various options and provided input to guide the Air District in developing the air monitoring guidelines.

Under the proposed rule, within one year of Air District approval of a refinery's air monitoring plan, the refinery owner/operator would be required to ensure that fence-line monitoring systems are operational. Within two years after Air District approval of the air monitoring plan, the community air monitoring systems would be required to be operational. Both systems would be

installed, operated, and maintained, in accordance with the approved plan (see Sections 12-15-501 and 502 of the proposed rule).

The BAAQMD would update the initial air monitoring guideline document within a five- year period of the publication of the initial guideline document. The guidelines would be updated in consideration of advances in monitoring technology, updated information regarding the health effects of air pollutants, and review of data collected by existing monitoring systems required under the rule. The refinery owner/operator would be required to implement any needed modifications to existing monitoring systems within one year of publication of the updated guidelines.

## **1.5.2 REGULATION 12, RULE 16**

### **1.5.2.1 Limited Exemption**

The proposed Rule 12-16, which would use many of the plans and reports required by Rule 12-15, is designed to mitigate emissions increases, such as those caused by changes in crude oil composition, based on mass emissions from refineries as a whole. There are three limited exemptions in the rule. The first exemption, contained in Section 12-16-102, applies to small refineries whose processing capacity of total crude oil is 5,000 barrels per day or less. This exemption is intended to limit the requirements of the rule to the Chevron, Phillips 66, Shell, Tesoro and Valero refineries operating in the Bay Area and not include operations solely involving asphalt or oil recycling.

A second exemption applies to criteria pollutants and GHG emission increases resulting solely from additional crude oil throughput. This allows the refineries flexibility in production that may result from increases in demand or the reduction of output from other California refineries. Both Rules 12-15 and 12-16 are intended to address any increase in emissions caused by changes in crude oil composition.

A third exemption deals with GHG emissions. GHG emissions increases are still required to be addressed in the causal analysis described in Section 12-16-401.1, but need not be addressed in the emissions reductions measures discussed in Section 12-16-401.2. This exemption avoids confusion and conflict with CARB's Cap-and-Trade Program. However, since the proposed Tracking and Mitigation rules require the collection of information relevant to GHGs, the District is positioned to take action at a later date based on sound emissions data if appropriate.

### **1.5.2.2 Administrative Procedures**

The Mitigation Rule would require various reports and plans be submitted to the Air District and subjected to public review. Comments received from the public would be considered by Air District staff prior to taking final action. Commenters would be notified of final actions and approved reports and plans would be posted on the Air District's website.



### **1.5.2.3 Emissions Trigger Levels**

Sections 12-16-301.1 through Sections 12-16-301.3 would provide threshold trigger levels that will require a refinery owner/operator to submit an Emission Reduction Plan (ERP). The thresholds are defined in relation to the PREP required by the Tracking Rule.

The trigger levels for criteria pollutant described in Section 12-16-301.1 were designed to take into account fluctuations that occur in refineries on a year-to-year basis that may be the result of process changes and degradation of processes. Emissions variations like these are considered to be in the “noise” of emissions inventories and the ability of the inventory calculations to provide accurate, repeatable results. By allowing these thresholds, staff believes ERPs will be able to better identify and address equipment that can produce effective and lasting emission reductions.

The threshold triggers for TACs described in Section 12-16-301.2 were developed to ensure that health impacts at the maximally exposed individual, as defined by the HRA required in the Tracking Rule, do not increase by more than 10 in one million for cancer risk or by more than 1 for chronic hazard index. Section 12-16-301.3 establishes a more stringent threshold of “any” increase in toxicity weighted emissions, if the HRA required by the Tracking Rule finds that a refinery has health impacts greater than the Air District’s Air Toxic Hot Spots (AB-2588) Mandatory Risk Reduction Thresholds.

### **1.5.2.4 Pollutant and Source Coverage**

Since the Rule 12-16, the Mitigation Rule, is designed to work in tandem with the Rule 12-15, Tracking Rule, pollutants and sources covered are the same. However, mitigation of GHG’s is not required at this time in deference to CARB’s Cap-and-Trade Program. ERPs can propose reductions at any source that will bring overall refinery emissions below threshold triggers. This will allow flexibility to determine the most effective measures to reduce emissions. The feasibility of the reduction measures will be judged based on the cost effectiveness levels contained in Table 3 in Section 12-16-401.3.3.

### **1.5.2.5 Emissions Reduction Plan (ERP)**

Section 401 of the proposed Mitigation Rule would require the refinery owner/operator to prepare and submit to the District an ERP that contains: 1) a causal analysis of why emissions increased above trigger thresholds (Section 12-16-401.1); 2) a legal commitment to measures that are planned to reduce emissions (Section 12-16-401.2); and, 3) potentially, an emission reduction audit requiring implementation of all feasible measures for further reductions (Section 12-16-401.3) if planned reductions would not result in emissions being reduced to below trigger thresholds within two years. An updated ERP would be required if the emissions are not reduced to below trigger levels as provided in the initial ERP (Section 12-16-402). While all sources are intended to be covered by proposed Regulation 12, Rule 16, it is the intent of staff to not require additional controls or limits on sources where all feasible measures are already in place. It is expected that each ERP that requires permitting would be reviewed pursuant to the CEQA.

### **1.5.2.6 Toxic Air Contaminant Trigger Levels and HRAs**

Specific trigger levels for each refinery would be set based on the HRAs developed in the Tracking Rule and are discussed in Section 12-16-404. These trigger levels would be set to ensure that risks don't increase above the health risk thresholds based on the latest information included in OEHHA guidelines. Staff believes that allowing the refinery owners/operators flexibility in reducing TACs to below trigger levels allows for the most effective targeting of reduction strategies.

Section 12-16-303 requires an updated HRA in addition to the requirements of Section 401, to verify that the ERP measures have reduced risk from the facility to below AB 2588 mandatory risk reduction thresholds. An updated HRA is not required if the inventory year showing the emissions increase is less than five years from the inventory year for the most recent Air District-approved HRA. HRA updates are appropriate for sites that are subject to mandatory risk reduction measures to ensure that the risk reduction measures employed are effectively reducing health impacts. These provisions also ensure that additional information regarding TACs and health risks are incorporated and reviewed by Air District staff and will provide additional assurance that refinery health impacts will not increase in the future.

### **1.5.2.7 Crude Oil Throughput**

The proposed rule would exempt emissions caused solely by increased throughput of crude oil. This allows refineries to respond to demand by either market forces or reduced production of other California refineries. Refineries must always maintain compliance with any limitations currently contained in Air District operating permits, but as a matter of practice rarely operate at this "maximum" rate. Increases in throughput consistent with compliance with Air District permit limits thus would not trigger the requirements of the Mitigation Rule.

Staff considered various ways to allow flexibility in production rate while still requiring all feasible mitigation of changes that affect emissions. Relating emissions to inputs is an extremely difficult, if not impossible, task. Refineries vary output of products depending on market demands, which affects emissions. In addition, operation of various units and processes may vary, also affecting emissions. These changes in emissions can occur without varying crude oil throughput. Inputs besides crude oil, commonly called intermediates, also have an effect on emissions without necessarily being related to crude oil throughput. Attempting to track and accurately relate all these variables to changes in overall annual emissions may prove to be extremely difficult and would not allow for flexibility in managing overall refinery emissions.

Staff believes the methodology presented in Section 12-16-405 represents the clearest, most efficient way to provide flexibility in allowing crude oil throughput variability. Refinery owner/operators will be able to quickly determine whether emissions changes are tied to crude oil throughput and, therefore, better manage overall refinery emissions to meet the thresholds presented in the proposed rule.

## Chapter 2

# Environmental Checklist

## INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

## GENERAL INFORMATION

Project Title:	Bay Area Air Quality Management District (BAAQMD) Proposed Regulation 12, Rule 15: Petroleum Refining Emissions Tracking and Regulation 12, Rule 16: Petroleum Refining Emissions Analysis, Thresholds and Mitigation
Lead Agency Name:	Bay Area Air Quality Management District
Lead Agency Address:	939 Ellis Street San Francisco, California 94109
Contact Person:	Eric Stevenson
Contact Phone Number:	415-749-4695
Project Location:	Proposed Rules 12-15 and 12-16 would apply to the five refineries 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. The five refineries include Chevron (Richmond), Phillips 66 (Rodeo), Shell (Martinez), Tesoro (Martinez) and Valero (Benicia).
Project Sponsor's Name:	Bay Area Air Quality Management District
Project Sponsor's Address:	939 Ellis Street San Francisco, California 94109
General Plan Designation:	Rules 12-15 and 12-16 would apply to refineries in the Bay Area, which are primarily located in industrial areas.
Zoning:	See "General Plan Designation" above
Description of Project:	See "Background" in Chapter 1.
Surrounding Land Uses and Setting:	See "Affected Area" in Chapter 1.
Other Public Agencies Whose Approval is Required:	None

## Environmental Factors Potentially Affected:

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "x" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Aesthetics                          | <input type="checkbox"/> Agriculture and Forestry Resources       | <input checked="" type="checkbox"/> Air Quality                        |
| <input type="checkbox"/> Biological Resources                | <input type="checkbox"/> Cultural Resources                       | <input type="checkbox"/> Geology / Soils                               |
| <input checked="" type="checkbox"/> Greenhouse Gas Emissions | <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" 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 checked="" 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 in 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 a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, 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 EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Signature:

February 23, 2015

Date:

Eric Stevenson

Printed Name:

February 23, 2015

Date:

## EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant with Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, Program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:
  - a) Earlier Analysis Used. Identify and state where they are available for review.
  - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c) Mitigation Measures. For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures, which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This checklist is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
  - a) the significance criteria or threshold, if any, used to evaluate each question; and
  - b) the mitigation measure identified, if any, to reduce the impact to less than significance.

**ENVIRONMENTAL CHECKLIST AND DISCUSSION**

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than- Significant Impact	No Impact
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**I. AESTHETICS.**

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 to 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 checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>

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**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 four of the refineries affected by the proposed rules are located in Contra Costa County and one is located in Solano County (Valero).

The proposed new rules focus on tracking air emissions and crude oil quality characteristics from Bay Area petroleum refineries over time, completing health risk assessments for the petroleum refineries, and establishing monitoring systems to provide detailed air quality data along refinery boundaries and in nearby communities, as well as, establishing emission thresholds, triggering causal analysis if thresholds are exceeded, and establishing Emission Reduction Plans (ERPs). The proposed new rules will affect five refineries currently operating within the Bay Area which are located in industrial areas. Scenic highways or corridors are generally not located in the vicinity of these facilities.

**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, b, and c).** The proposed new Rules 12-15 and 12-16 would track air emissions and crude oil characteristics from Bay Area petroleum refineries, would require health risk assessments and establish monitoring systems, as well as establish emission thresholds, trigger causal analysis, and establish ERPs if those thresholds are exceeded.

Proposed Rule 12-15 is not expected to require the construction of any substantial new structures that would impact the views of the refineries or areas outside of existing refinery boundaries. Rule 12-15 is a recordkeeping/monitoring rule that would require the installation of fenceline monitors as well as community monitoring stations near each refinery. The fenceline monitors are within the refinery boundaries and are expected to be approximately the same height as the existing fences and would be compatible with the existing industrial structures within the Refinery. Community air monitors are also required under Rule 12-15 and would be placed near each refinery. The community monitors may or may not be visible to the community, depending on their location. If a community monitor is placed on an existing building/structure it is not likely to be visible to the community. At some locations, a portable trailer may be used for monitoring, which would also require security fencing to protect the monitoring station. In this case, the monitoring station could be visible to the community, but the height of the monitoring station is expected to be eight to ten feet.

Proposed Rule 12-16 could require air pollution control equipment on various refinery sources, (e.g. boilers and heaters.) These emission controls could lead to changes in operations or installation of new air pollution control devices. While these control devices may be visible to surrounding areas, they would be installed within existing industrialized areas and are not expected to be taller than existing refinery structures. Any new equipment would be located within the refineries, would be compatible with the urban/developed nature of the refineries, are not expected to block any scenic vista, degrade the visual character or quality of the area, or result in any adverse aesthetic impacts. Once implemented, equipment associated with the new rule is not expected to be noticeably visible within the refineries. Therefore, the proposed new rule is not expected to have adverse aesthetic impacts to the surrounding community.

**I. d).** The refineries affected by the proposed Rule 12-16 may be required to install additional air pollution control equipment or modify operations. Further, refinery modifications may require additional lighting. However, refineries are already lighted for night-time operations and safety measures, and are located in appropriately zoned areas that are not usually located next to residential areas. New light sources, if any, are not expected to be noticeable in residential areas. Most local land use agencies have ordinances that limit the intensity of lighting and its effects on adjacent property owners. Therefore, the proposed new rules are not expected to have significant adverse aesthetic impacts to the surrounding community.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to aesthetics are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**II. AGRICULTURE and FORESTRY 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 as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. 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) | Conflict with existing zoning for, or cause rezoning of, forest land as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? |                          |                          |                          |                                     |
| d) | Result in the loss of forest land or conversion of forest land to non-forest use?  |                          |                          |                          |                                     |
| e) | Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest 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 proposed new rules focus on tracking air emissions and crude oil quality characteristics from Bay Area petroleum refineries over time, completing health risk assessments for the petroleum refineries, and establishing monitoring systems to provide detailed air quality data along refinery boundaries and in nearby communities, as well as, establishing emission thresholds, triggering causal analysis, and establishing ERPs if those thresholds are exceeded. The proposed new rules will affect five refineries currently operating within the Bay Area which are located in industrial areas. Agricultural or forest resources are currently not located within the confines of the existing refineries that would be required to comply with Regulations 12-15 and 12-16.

## Regulatory Background

Agricultural and forest 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, b, c, d, and e).** The affected refineries are located in industrial areas where agricultural or forest resources are generally not located. No substantial construction activities are expected to comply with reporting and monitoring activities associated with proposed Rule 12-15. Rule 12-16 could require air pollution control equipment on various refinery sources or changes in operations at any or all of the Bay Area refineries. Construction activities may be associated with compliance with Rule 12-16 and the implementation of ERPs. Such construction activities are expected to be limited to the existing refineries. No agricultural or forest resources are located within the boundaries of the existing refineries and construction activities would not convert any agricultural or forest land into non-agricultural or non-forest use, or involve Williamson Act contracts.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to agriculture and forest resources are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

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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.**

Where 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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"/>

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**Setting**

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.

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. The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NO<sub>x</sub>), and SO<sub>2</sub> and the federal 24-hour PM<sub>2.5</sub> standard. The Air District is not considered to be in attainment with the State PM<sub>10</sub> and PM<sub>2.5</sub> standards. At The Bay Area is designated as non-attainment for the federal 8-hour and California one- and eight-hour ozone standards.

## 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, the California Air Resources Board (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.

The BAAQMD is governed by a 22-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. 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 Air 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 Emissions Standards for Hazardous Air Pollutants (NESHAP) 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 were to 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 would 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 TACs 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).** Proposed Rules 12-15 and 12-16 are not expected to conflict with or obstruct implementation of the applicable air quality plan. The 2010 Bay Area Clean Air Plan (CAP) was approved by the Air District's Board of Directors on September 15, 2010, and is the approved air quality plan that the Air District operates under. Proposed Rules 12-15 and 12-16 would track air emissions and crude oil characteristics from Bay Area petroleum refineries, require health risk assessments refineries, establish monitoring systems, establish emission thresholds, require causal analysis if the thresholds are exceeded, and require preparation of ERPs. The proposed regulations would require recordkeeping and monitoring and may require the modification of any existing emission sources. Proposed Rules 12-15 and 12-16 would not conflict with or obstruct implementation of the 2010 CAP as it is not expected to interfere with any other District rules and regulations.

**III. b, c, and d).** A number of air quality rules and regulation that apply to refineries are enforced by the BAAQMD. These existing rules and regulations require: (1) air permits; (2) the use of best available control technology (BACT); (3) new source review for new emission sources and offsets for new emissions; (4) control of toxic air contaminants; (5) control of fugitive emission sources including storage tanks, equipment leaks, bulk loading, and wastewater separators; and (6) control of emissions from combustion sources, including process heaters, boilers, internal combustion engines, gas turbines, catalytic cracking and reforming units, and flares. Rule 12-15 would require recordkeeping and monitoring. However, Rule 12-16 could require the modification to refineries to further reduce emissions either through the installation of air pollution control equipment or changes in operations.

Although the primary effect of installing air pollution control equipment is to reduce emissions of a particular pollutant, e.g., VOCs, some types of control equipment have the potential to create secondary adverse air quality impacts, e.g., increased NO<sub>x</sub> emissions if VOC emissions are controlled through a combustion process (e.g., afterburner) or require additional energy to operate. Control measures aimed at reducing NO<sub>x</sub> from stationary sources may use ammonia for control (e.g., selective catalytic reduction). Ammonia use could result in increased ammonia emissions and, since ammonia is a precursor to particulate formation, increased particulate emissions. Because of the potential for secondary emissions from air pollution control equipment, there is a potential that sensitive receptors could be exposed to increased pollutant concentrations, which may be significant. As a result, these potential air quality impacts will be evaluated in the Draft EIR.

**III. e).** Rules 12-15 and 12-16 would track air emissions and crude oil characteristics from Bay Area petroleum refineries, require health risk assessments refineries, establish monitoring systems, establish emission thresholds, require causal analysis if the thresholds are exceed, and require preparation of ERPs. The proposed new rules are not expected to result in an increase in odorous emissions at the refineries. Odorous emissions are not specifically proposed to be covered by the Rules 12-15 and 12-16, although most of these pollutants are also included in one of the categories of regulated air pollutants that would be covered, e.g., hydrogen sulfide, which is the primary odorous compound emitted from the refineries, is included as a TAC. The information gathered as part of proposed Rule 12-15 and 12-16 would be used to develop emission limitations which could include odorous emissions. Therefore, the proposed new rules are not expected to result in an increase in the generation of emissions that could generation odors.

## Conclusion

Implementation of Rules 12-15 and 12-16 are expected to minimize refinery emissions of criteria pollutants and TACs. However, secondary adverse air quality impacts could occur from implementing ERPs at individual refineries due to localized increases in criteria pollutant or toxic air contaminant emissions from certain types of air pollution control equipment. Therefore, potential adverse secondary air quality impacts resulting from implementing Rules 12-16 will be evaluated in the Draft EIR. No significant impacts were identified on air quality plans or the generation of odors and these topics will not be addressed further in the Draft EIR.

	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 Wildlife 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 Wildlife 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 new rules 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. Four of the refineries affected by the proposed rules are located in Contra Costa County and one is located in Solano County (Valero). The refineries affected by the proposed new Rules have been graded to develop various permanent refinery structures, buildings, operating units and storage tanks. Native vegetation, other than landscape vegetation, has generally been removed from the refineries to minimize safety and fire hazards.

## 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 Wildlife, 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 Wildlife administers the California Endangered Species Act which prohibits impacting endangered and threatened species. The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (U.S. EPA) regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

## Discussion of Impacts

**IV. a), b, and d).** No impacts on biological resources are anticipated from the proposed new rules which would apply to existing refineries. Monitoring and air pollution control equipment associated with the proposed new rules will operate primarily within existing refineries which do not typically include sensitive biological species. The refinery facilities have been graded and developed, and biological resources, with the exception of landscape species, have been removed. Construction activities would be limited to monitoring or air pollution control equipment within existing refineries or small portable monitoring stations in nearby communities. Construction associated with monitoring equipment whether on fencelines or in nearby communities will be minimal. Construction of any air pollution control equipment would take place within the operating portions of existing refineries which are void of biological resources and would not impact sensitive biological resources directly or indirectly, impact riparian habitats, or protected wetlands. The installation of monitors or air pollution control equipment would also not interfere with the movement of any migratory fish or wildlife species

or impacts migratory corridors; would not conflict with local policies or ordinances protecting biological resources; and would not conflict with an adopted habitat conservation plan.

**IV. c).** ERPs could result in the installation of additional air pollution control equipment at existing refineries. The installation of air pollution control equipment at these facilities would be consistent with industrial land uses. The operating portions of the existing refineries do not contain marshes, vernal pools, wetlands, etc. Therefore, construction would not impact these biological resources. For these reasons the proposed new rules are not expected to adversely affect protected wetlands as defined by §404 of the Clean Water Act, including, but not limited to marshes, vernal pools, coastal wetlands, etc., through direct removal, filling, hydrological interruption or other means.

**IV. e and f).** Proposed Rules 12-15 and 12-16 are not expected to affect land use plans, local policies or ordinances, or regulations protecting biological resources such as a tree preservation policy or ordinances for the reasons already given. Land use and other planning considerations are determined by local governments and land use or planning requirements are not expected to be altered by the proposed project. Similarly, the proposed new rules are not expected to affect any habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to biological resources are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

	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 §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 §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 of 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 petroleum refineries and nearby communities affected by the proposed new rules are existing facilities within the Bay Area. These facilities have already been graded or developed, and are typically surrounded by other industrial uses. 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 §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 §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 §§50020.1(k) and 5024.1(g).

## Discussion of Impacts

**V. a, b, c and d).** No impacts on cultural resources are anticipated from the proposed new rules which would apply to existing refineries. Monitoring equipment and new emission control equipment associated with the proposed Rules 12-15 and 12-16 would operate primarily within existing refineries which have been graded and developed. Historic resources are typically not located within refineries and no demolition activities are expected to be required so no impacts on historic resources are expected. Construction activities would be limited to areas within existing refineries and the placement of monitoring stations near/adjacent to the fencelines and within nearby communities, i.e., within areas that have already been graded and developed. Any construction activities which may be required to implement ERPs under Rule 12-16 are expected to be limited to within refinery boundaries. Therefore, construction activities are not expected to impact cultural resources, including historical and archaeological resources, either directly or indirectly, or disturb human remains.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to cultural resources are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**VI. GEOLOGY AND SOILS.**

Would the project:

- a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - i) 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 know fault? Refer to Division of Mines and Geology Special Publication 42.
  - ii) Strong seismic ground shaking?
  - iii) Seismic-related ground failure, including liquefaction?
  - iv) Landslides?
- b) Result in substantial soil erosion or the loss of topsoil?
- c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?
- d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
- 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?

## 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 new rules are located primarily in industrial areas within the Bay Area.

The affected petroleum refineries 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 California 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, c, and d).** The petroleum refineries affected by the proposed rule already exist and operate within the confines of existing industrial facilities in the Bay Area. Construction activities would be required to place monitoring stations near/adjacent to the refinery fencelines and within nearby communities. Construction activities could also be required to install air pollution control equipment associated with implementation of ERPs. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries and would be required to comply with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. Any construction at industrial facilities regulated by the new rule will be, or have been, constructed in compliance with the California Building Code. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code basis seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards.

Any new development at the petroleum refineries affected by the new rule would be required to obtain building permits, as applicable, for new foundations and structures at any site. The issuance of building permits from the local agency will assure compliance with the California Building Code, which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since the construction of any new structures would be required to comply with the California Building Code.

**VI. b).** Construction activities would be limited to the confines of existing refineries or the placement of monitoring stations near/adjacent to refinery fencelines and within nearby communities. Community monitors are expected to be placed on existing structures or within portable trailers that could take up about an 8 feet by 12 feet area. New refinery equipment would be placed within the confines of the existing refineries which are already graded and developed. Proposed Rules 12-15 and 12-16 are not expected to result in substantial soil erosion or the loss of topsoil as construction activities would be limited to areas that have been already been graded and developed, and adjacent to other existing refinery operations.

**VI. e).** Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. Rules 12-15 and 12-16 would affect existing refineries that are already connected to appropriate wastewater facilities. Based on these considerations, septic tanks or other alternative wastewater disposal systems are not expected to be impacted by Rules 12-15 and 12-16.

## **Conclusion**

Based upon the above considerations, significant adverse project-specific impacts to geology and soils are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.



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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**VII. GREENHOUSE GAS EMISSIONS.**

Would the project:

- |    |   |                                     |                          |                          |                                     |
|----|---|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
| a) | Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?      | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| b) | Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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**Setting**

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth’s surface and atmosphere. One identified cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs identified by the Kyoto Protocol are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. Approximately 80 percent of GHG emissions in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (BAAQMD, 2010).

**Regulatory Background**

In response to growing scientific and political concern regarding global climate change, California has taken the initiative to address the state’s greenhouse gas emissions. California has adopted the Global Warming Solutions Act of 2006, also known as AB 32, which requires the state to reduce its GHG emissions to 1990 levels by 2020. In addition, in 2005 Governor Schwarzenegger adopted Executive

Order S-3-05, which commits to achieving an 80% reduction below 1990 levels by 2050. The California Air Resources Board (CARB) has begun implementation of these mandates through adoption of regulatory requirements to reduce GHG emissions (among other agency implementation actions). All refineries affected by the proposed new rules are under CARB's AB32 cap and trade program, which established a limit on GHG emissions for each refinery. GHG emissions over the limit require additional GHG emission reductions or purchase of GHG emission credits from sources that had excess emission credits.

At the federal level, the U.S. EPA has adopted GHG emissions limits for new light-duty cars and trucks. This regulation of mobile sources has in turn triggered New Source Review and Title V permitting requirements for stationary sources. These requirements include using Best Available Control Technology to control emissions from major facilities. In addition, the U.S. EPA is also in the process of adopting New Source Performance Standards for major GHG source categories (currently limited to electric utility generating units).

The U.S. Congress passed "The Consolidated Appropriations Act of 2008" (HR 2764) in December 2007, which requires reporting of GHG data and other relevant information from large emission sources and suppliers in the United States. The Rule is referred to as 40 Code of Federal Regulations (CFR) 4 Part 98 - Greenhouse Gas Reporting Program (GHGRP). Facilities that emit 25,000 metric tonnes or more per year of GHGs are required to submit annual reports to U.S. EPA.

## Discussion of Impacts

**VII. a).** Rule 12-15 is designed to track air emissions and crude oil characteristics from the five petroleum refineries located within the jurisdiction of the BAAQMD. Rule 12-15 requires recordkeeping and monitoring while Rule 12-16 requires the development of emission thresholds and ERPs, if those thresholds are exceeded. Rules 12-16 could require the installation of additional air pollution control equipment or modify refinery operations. The proposed new rules could require new construction activities and the operation of new/modified refinery equipment. The goal of Rule 12-15 and 12-16 is to minimize overall refinery emissions, however, refinery modifications could result in the increased use of fuel for combustions sources (e.g., electricity, natural gas, or refinery fuel gas), potentially generating additional greenhouse gas emission impacts, which will be evaluated in the Draft EIR.

**VII. b).** All refineries affected by the proposed new rules are under CARB's AB32 cap and trade program. Rules 12-15 requires monitoring and recordkeeping for various refinery emissions, including GHG emissions. However, Rule 12-16 exempts GHG emissions from the emission reduction requirements of the ERP to avoid confusion and conflict the CARB's cap and trade rule established under AB 32. As such, the proposed new rules are not expected to conflict with an existing plan, policy or regulation.

## Conclusion

Based upon the above considerations, the potential GHG emissions associated with Rule 12-16 will be evaluated in the Draft EIR. No significant impacts on GHG plans, policies, or regulations were identified so this topic will not be addressed further in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**VIII. HAZARDS AND HAZARDOUS MATERIALS.** Would the project:

- |  |                                     |                          |                          |                                     |
|--|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input 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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input 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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input 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 § 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) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, 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) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?  | <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"/> |

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## Setting

The affected petroleum refineries 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 the public. “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 refinery are unique and determined by a variety of factors. The areas affected by the proposed new rule are typically located in industrial 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, §112. The SPCC is designed to prevent spills from on-site facilities (e.g., storage tanks) 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 business 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 considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

## Discussion of Impacts

**VIII. a, b, and c).** Proposed Rule 12-15 is a monitoring and recordkeeping rule that is not expected to generate additional hazards. Proposed Rule 12-16 has the potential to create direct or indirect hazard impacts associated with refinery modifications. The requirement to develop ERPs could result in additional construction activities at the refineries, refinery modifications, and/or changes in refinery operations. Some refinery modifications and changes in operations could generate additional hazard impacts. NO<sub>x</sub> emission reduction measures could result in the increased use of ammonia in selective catalytic reduction (SCR) units. Ammonia is a hazardous material. These potential hazard impacts will be further evaluated in the Draft EIR.

**VIII. d).** Government Code §65962.5 requires creation of lists of facilities that may be subject to Resource Conservation and Recovery Act (RCRA) permits or site cleanup activities. The refineries affected by the proposed rules may be located on the hazardous materials sites list pursuant to Government Code §65962.5. The refineries would be required to manage any and all hazardous materials in accordance with federal, state and local regulations. Proposed Rules 12-15 and 12-16 are not expected to interfere with site cleanup activities or create additional site contamination. Therefore, this topic is less than significant and will not be further evaluated in the Draft EIR.

**VIII. e and f).** Rules 12-15 and 12-16 are not expected to result in a safety hazard for people residing or working within two miles or a public airport or air strip. No impacts on airports or airport land use plans are anticipated from the proposed new rules which would apply to petroleum refineries operating in the Bay Area, which are generally not located near public airports or air strips. Any construction activities are expected to be confined to the existing refinery boundaries. Therefore, no significant adverse impacts on an airport land use plan or on a private air strip are expected.

**VIII. g).** No impacts on emergency response plans are anticipated from the proposed new rules that would apply to existing petroleum refineries. The refineries affected by the proposed new rules already exist and operate within the confines of existing industrial facilities. The proposed new rule neither requires, nor is likely to result in, activities that would impact any emergency response plan. The existing refineries affected by the proposed new rule already store and transport hazardous materials, so emergency response plans already include hazards associated with existing refinery operations. The proposed new rules are not expected to require any changes in emergency response planning. Therefore, no significant adverse impacts on emergency response plans are expected.

**VIII. h).** No increase in hazards associated with wildfires is anticipated from proposed Rules 12-15 and 12-16. The petroleum refineries affected by the proposed new rule already exist and operate within the confines of existing industrial facilities. Native vegetation has been removed from the operating portions of the affected facilities to minimize fire hazards. Rules 12-15 and 12-16 are not expected to increase the risk of hazards associated with wildland fires in general and specifically in areas with flammable materials. Therefore, Rules 12-15 and 12-16 would not expose people or structures to significant risk of loss, injury or death involving wildland fires.

## Conclusion

Based upon the above considerations, the potential refinery hazards that may be introduced due to compliance with Rule 12-16 will be evaluated in the Draft EIR. No significant hazard impacts on sites listed pursuant to Government Code §65962.5, public airports or airstrips, emergency response plans or hazards associated with wildfires are expected and these topics will not be addressed further in the Draft EIR.

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

Would the project:

a) Violate any water quality standards or waste discharge requirements?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 the 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

- j) Inundation by seiche, tsunami, or mudflow?

## 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 petroleum refineries, affected by the proposed new rule are located within Contra Costa and Solano counties, under the jurisdiction of the BAAQMD. Affected areas are generally surrounded by other industrial 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 adopted the State Water Resources Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary in 2006. San Francisco Bay, and its constituent parts, including Carquinez Strait and Suisun Bay, are considered to be enclosed bays (indentations along the coast that enclose an area of oceanic water within distinct headlands or harbors). The Plan consists of: (1) beneficial uses to be protected; (2) water quality objectives for the reasonable protection of beneficial uses; and (3) a program of implementation for achieving the water quality objectives. Together, the beneficial uses and the water quality objectives established to reasonably protect the beneficial uses are called water quality standards under the terminology of the federal Clean Water Act. The beneficial uses of the Carquinez Strait that must be protected which include: municipal and domestic water supply systems, industrial service supply systems, agricultural supply systems, ground water recharge, navigation, water contact and non-contact recreation, shell fish harvesting, commercial and sport fishing, cold freshwater habitat, migration of aquatic organisms, spawning reproduction and early development, wildlife habitat, estuarine habitat, and preservation of rare, threatened, and endangered species.

## Discussion of Impacts

**IX. a, b, and f).** Rule 12-15 requires recordkeeping and monitoring while Rule 12-16 requires the development of emission thresholds and ERPs, if those thresholds are exceeded. Rules 12-16 could require the installation of additional air pollution control equipment or modify refinery operations. The proposed new rules could require new construction activities and the operation of new/modified refinery equipment. The goal of Rule 12-15 and 12-16 is to minimize overall refinery emissions, however, refinery modifications could result in the increased use of water. Control measures that reduce particulate and/or SOx emissions could require additional water use and wastewater discharge from devices like wet gas scrubbers. The potential increase and water use and the potential to deplete groundwater supplies will be evaluated in the Draft EIR.

The affected refineries are subject to wastewater discharge and pretreatment requirements and are expected to continue to comply with all relevant wastewater requirements, waste discharge regulations and standards for stormwater runoff, and any other relevant requirements for discharges into sewer systems. These standards and permits require water quality monitoring and reporting for onsite water-related activities. Should the volume or discharge limits change as a result of implementing control measures, the facility would be required to consult with the appropriate regional water quality control board and/or the local sanitation district to discuss these changes. Nonetheless, implementing Rule 12-16 may generate additional wastewater that could impact water quality standards or waste discharge requirements. Therefore, this topic will be evaluated further in the Draft EIR.

**IX. c, d, and e).** Rule 12-15 requires recordkeeping and monitoring while Rule 12-16 requires the development of emission thresholds and ERPs, if those thresholds are exceeded. Rule 12-15 is a recordkeeping/monitoring rule that would require the installation of fence-line monitors, as well as a community monitoring station near each refinery. The new monitoring equipment is small and would be placed within the existing refineries and in the communities adjacent to the refineries. Rule 12-16 could result in ERPs that require additional control of emissions from refinery equipment on stationary emissions. The proposed project does not have the potential to substantially increase the area subject to runoff since the construction activities are expected to be limited in size and would be located within

existing refineries that have already been graded. In addition, storm water drainage within refineries has been controlled and construction activities are not expected to alter the storm water drainage within the refineries. Therefore the proposed new rule is 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. Additionally, the proposed rules are not 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 contaminated runoff. Therefore, no significant adverse impacts to storm water runoff are expected and it will not be further evaluated in the Draft EIR.

**IX. g, h, i, and j)** The proposed project does not include the construction of new or relocation of existing housing or other types of facilities and, as such, would not require the placement of housing or other structures within a 100-year flood hazard area. (See also XIII “Population and Housing”). As a result, the proposed project would not be expected to create or substantially increase risks from flooding; expose people or structures to significant risk of loss, injury or death involving flooding; or increase existing risks, if any, of inundation by seiche, tsunami, or mudflow. Consequently, this topic will not be evaluated further in the Draft EIR.

## Conclusions

The potential increase and water use and the potential to deplete groundwater supplies will be evaluated in the Draft EIR. No significant adverse water quality impacts were identified for stormwater runoff, flood hazards, or inundation hazards and these topics will not be addressed in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X. 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 new rules are primarily located in industrial 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

**X. a, b, and c)** Construction activities associated with the proposed new rules would be required to place monitoring stations near/adjacent to the refinery fencelines and within nearby communities. Construction activities could also be required to install air pollution control equipment associated with implementation of ERPs. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries. The land use within the refineries is typically zoned for heavy industrial uses. Land uses surrounding the refineries can vary considerably and include industrial areas, commercial areas, open space, and residential areas. Construction activities would be limited to the confines of the refineries. The installation of air monitors or air pollution control equipment would not change or impact existing land uses.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to land use and planning are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**XI. MINERAL RESOURCES.** Would the project:

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?                                 | <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"/> |

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## 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 Rules 12-15 and 12-16 are primarily located in industrial areas within 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

**XI. a and b).** Rules 12-15 and 12-16 would require the installation of fenceline monitors, as well as a community monitoring station near each refinery, and could require construction of air pollution control equipment. The proposed new rules 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.

## **Conclusion**

Based upon the above considerations, significant adverse project-specific impacts to mineral resources are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. NOISE.</b> Would the project result in:				
a) Exposure of 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 checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) 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 checked="" type="checkbox"/>	<input type="checkbox"/>
d) 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 checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip would the project 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 new rules are located in industrial areas of the Bay Area, which are primarily surrounded by other industrial 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 Plans 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

**XII. a, b, c, and d).** The petroleum refineries affected by the proposed new rules already exist and operate within the confines of existing industrial facilities in the Bay Area. Construction activities would be required to place monitoring stations near/adjacent to the refinery fencelines and within nearby communities. Construction activities could also be required to install air pollution control equipment associated with implementation of ERPs. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries, located within industrial areas. However, those construction activities would be required to comply with local noise ordinances, which generally prohibit construction during the nighttime, in order to minimize noise impacts. Compliance with the local noise ordinances is expected to minimize noise impacts associated with construction activities to less than significant.

Ambient noise levels in industrial areas are typically driven primarily by freeway and/or highway traffic in the area and any heavy-duty equipment used for materials manufacturing or processing. It is not expected that any modifications to install air pollution control equipment would substantially increase ambient (operational) noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. It is not expected that affected facilities would exceed noise standards established in local general plans, noise elements, or noise ordinances currently in effect. Affected refineries would be required to comply with local noise ordinances and elements, which may require construction of noise barriers or other noise control devices.

It is also not anticipated that the proposed project will cause an increase in ground borne vibration levels because air pollution control equipment is not typically vibration intensive equipment. Consequently, Rules 12-15 and 12-16 are not expected to directly or indirectly cause substantial noise or excessive ground borne vibration impacts. Noise impacts, therefore, will not be further evaluated in the Draft EIR.

**XII. e and f).** If applicable, the petroleum refineries affected by the proposed new rules would still be expected to comply, and not interfere, with any applicable airport land use plans. The existing refineries are not located within existing airport land use plans. Rules 12-15 and 12-16 would not locate residents or commercial buildings or other sensitive noise sources closer to airport operations. As noted in the previous item, there are no components of the proposed regulations that would substantially increase ambient noise levels, either intermittently or permanently.

## Conclusion

Based upon the above considerations, no significant adverse project-specific noise impacts are expected due to implementation of Rules 12-15 and 12-16, therefore, noise impacts will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIII. 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 facilities affected by the proposed Rules 12-15 and 12-16 are refineries within the jurisdiction of the BAAQMD, which are located in industrial areas.

## 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

**XIII. a).** According to the Association of Bay Area Governments (ABAG), population in the Bay Area is currently about seven million people and is expected to grow to about nine million people by 2035 (ABAG, 2006). The proposed project is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area’s population or population distribution. The proposed Rules 12-15 and 12-16 will affect five refineries located in Contra Costa and Solano counties. It is expected that the existing labor pool would accommodate the labor requirements for any modifications at the affect refineries. In addition, it is not expected that the affected refineries would need to hire additional personnel to operate and maintain new control equipment on site because air pollution control equipment is typically not labor intensive equipment. In the event that new employees are hired, it is

expected that the existing local labor pool in the District can accommodate any increase in demand for workers that might occur as a result of adopting the proposed new regulations. As such, adopting the proposed Rules 12-15 and 12-16 are not expected to induce substantial population growth.

**XIII. b and c).** Because the proposed new rules include installing air monitoring equipment and possibly air pollution control equipment operated in industrial settings, the proposed Rules 12-15 and 12-16 are 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 new rules.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to population and housing are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**XIV. 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"/>

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**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 refineries affected by the proposed new rules are primarily located in industrial areas within 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. All refineries affected by the proposed rules, maintain fire-fighting equipment and trained personnel with fire-fighting and emergency response experience. In addition, all affected refineries operated on-site security systems.

**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

**XIV. a).** Rule 12-15 is designed to track air emissions and crude oil characteristics from the five petroleum refineries located within the jurisdiction of the BAAQMD. Rule 12-15 requires recordkeeping and monitoring, while Rule 12-16 requires the development of emission thresholds and ERPs, if those thresholds are exceeded. Rule 12-16 could require the installation of additional air pollution control equipment or modify refinery operations. As stated above, all refineries affected by the proposed rules, maintain on-site fire-fighting equipment and trained personnel with fire-fighting and emergency response experience. While proposed Rules 12-16 could require new construction activities and the operation of new/modified refinery equipment, the additional equipment is not expected to require additional service from local fire departments above current levels.

Refineries maintain their own security systems. Refineries are fenced and access is controlled at manned gates. Refinery would occur within the confines of the existing refineries. Therefore, the proposed project is not expected to increase the need or demand for additional police services above current levels.

As noted in the “Population and Housing” discussion above, the proposed new rules are not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, operation of new air monitoring and air pollution control equipment is not expected to require a substantial increase in employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to public services are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**XV. RECREATION.**

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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**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 refineries affected by the proposed Rules 12-15 and 12-16 are located in industrial areas within the Bay Area. Public recreational land can be located adjacent to, or in reasonable proximity to, these areas.

As noted in the “Population and Housing” discussion above, the proposed new rules are not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, operation of new air monitoring and air pollution control equipment is not expected to require additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

**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

**XV. a and b).** As discussed under “Land Use” above, there are no provisions of the proposed new rules 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 Rules 12-15 and 12-16. Air monitoring equipment would be installed within or adjacent to existing refineries, or on portable trailers, so no changes in land use would be required. Air pollution control equipment, if necessary, would be installed within the confines of existing refineries and would not impact existing recreational facilities.

As noted in the “Population and Housing” discussion above, the proposed new rules are not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, operation of new air monitoring and air pollution control equipment is not expected to require a substantial increase in employees. Therefore, there will be no increase in local population and thus no impacts are expected to local recreational facilities.

## Conclusion

Based upon the above considerations, significant adverse project-specific impacts to recreation are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

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

- |   |                          |                          |                          |                                     |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established b the county congestion management agency for designated roads or highways?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" 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) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such 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). 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 currently contains over 1,300 directional miles of limited-access highways, which include both interstates and state highways. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing more localized access to individual communities. Together, these roadway facilities accommodate nearly 17 million vehicle trips a day. There are over 11,500 transit route miles of service including heavy rail (BART), light rail (Muni Metro and VTA Light Rail), commuter rail (Caltrain and ACE), 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 2010. The portion of commuters that carpool was about 11 percent in 2010, while an additional 10 percent utilize public transit. About 3 percent of commuters walked to work in 2010. In addition, other modes of travel (bicycle, motorcycle, etc.), account for three percent of commuters in 2010 (MTC, 2013). Cars, buses, and commercial vehicles travel about 149 million miles a day (2010) on the Bay Area Freeways and local roads. Transit serves about 1.6 million riders on the average weekday (MTC, 2013).

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. Interstate 780 is a four lane, east-west freeway extending from the Benicia-Martinez Bridge west to I-80 in Vallejo. The refineries affected by Rules 12-15 and 12-16 are located in the cities of Richmond, Rodeo, Martinez and Benicia, and are accessed by existing freeways and roads.

## Regulatory Background

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

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

**XVI. a and b).** The petroleum refineries affected by the proposed new rules already exist and operate within the confines of existing industrial facilities in the Bay Area. Construction activities would be required to place monitoring stations near/adjacent to the refinery fencelines and within nearby communities. Construction activities could also be required to install air pollution control equipment associated with implementation of ERPs. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries. Construction activities associated with the installation of monitoring equipment is expected to be limited to 1-2 employees and generate minimal traffic. Construction of air pollution control equipment could require more employees and truck deliveries if new refinery units were to be construction. Construction activities are temporary and the related construction worker traffic and delivery trucks would cease following completion of construction. No substantial increase in workers or average daily vehicle or truck trips is anticipated as a result of the proposed new rules. Therefore, the proposed rules are not expected to exceed, either individually or cumulatively, the current level of service at intersections in the vicinity of the refineries. The work force at each affected facility is not expected to substantially change as a result of the proposed rules and any permanent increase in operation-related traffic is expected to be minimal. Thus, the traffic impacts associated with the proposed Rules 12-15 and 12-16 are expected to be less than significant.

**XVI. c).** Rules 12-15 and 12-16 are would not result in a change in air traffic patterns or increase air traffic. Actions that would be taken to comply with the proposed new rules, such as installing of new monitoring or air pollution control equipment, would not influence or affect air traffic patterns. Further, air monitoring or air pollution control equipment are expected to be less than other existing structures at the refinery and would not impact navigable air space. Thus, Rules 12-15 and 12-16 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.

**XVI. d and e).** Rules 12-15 and 12-16 would not alter traffic patterns or existing roadways, as they are not expected to generate any substantial increase in traffic. The new rules would not create any traffic hazards or create incompatible uses at or adjacent to refineries. Any construction activities associated with the proposed new rules would be temporary and located within the confines of the existing refineries. 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 any roadway design feature that could increase traffic hazards. Emergency access at each refinery would not be impacted by implementation of Rules 12-15 and 12-16. Further, each affected refinery would continue to maintain their existing emergency access gates and installation of monitoring equipment or other refinery equipment is not expected to impact emergency access.

**XVI. f).** Activities resulting from the proposed Rules 12-15 and 12-16 would not conflict with policies supporting alternative transportation since the proposed new rules does not involve or affect alternative transportation modes (e.g. bicycles or buses). Any construction activities associated with the proposed new rules would be conducted at existing refineries and would be temporary so once completed, transportation, including alternative transportation modes, would not be effected.

## **Conclusion**

Based upon the above considerations, significant adverse project-specific impacts to transportation/traffic are not expected to occur due to implementation of Rules 12-15 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>XVII. UTILITIES/SERVICE SYSTEMS.</b> 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 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 hazardous waste disposal facilities are located in California: (1) The Clean Harbors facility in Buttonwillow (Kern County); and (2) the Waste Management facility in Kettleman Hills. Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada and USPCI, Inc., in Murray, Utah.

## Regulatory Background

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

## Discussion of Impacts

**XVII. a, b, d and e).** The refineries affected by the proposed Rules 12-15 and 12-16 already exist and already use water, generate wastewater, treat wastewater, and discharge wastewater under existing wastewater discharge permits. The proposed new rules would require air monitoring and potentially additional air pollution control equipment. The potential water use and wastewater impacts associated with implementation of proposed Rules 12-15 and 12-16 will be addressed under Hydrology and Water Quality (see Section IX a.).

**XVII. c).** Rules 12-15 and 12-16 would require air monitoring and possible air pollution control equipment, but would not alter the existing drainage system or require the construction of new storm water drainage facilities. Nor would the proposed new rules 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.

**XVII. f and g).** No significant impacts on waste generation are expected from the implementation Rules 12-15 and 12-16 because the rules would require additional air monitoring and potentially additional air pollution control equipment. Air monitoring or air pollution control equipment is not expected to create substantial quantities of solid or hazardous waste. Waste streams from refineries would be processed similarly as current methods, so no significant impact to land disposal facilities would be expected. Therefore, no significant impacts to hazardous waste disposal facilities are expected due to the proposed new rules. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

## Conclusion

The potential water and wastewater impacts associated with implementation of proposed Rules 12-15 and 12-16 will be addressed under Hydrology and Water Quality (see Section IX above). Based upon the above considerations, no additional significant adverse impacts are expected to storm water drainage, solid waste disposal or landfills due to implementation of Rules 12-15 and 12-16. Therefore, the impacts on utilities will not be further evaluated in the Draft EIR (except for the water and wastewater impacts that will be addressed under Hydrology and Water Quality).

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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**XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.**

- |    |  |                                     |                          |                          |                                     |
|----|--|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
| a) | Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? | <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 checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| c) | Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

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**XVIII. MANDATORY FINDINGS OF SIGNIFICANCE**

**Discussion of Impacts**

**XVIII. a).** Proposed Rules 12-15 and 12-16 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. Rules 12-15 would requires recordkeeping and monitoring, while Rule 12-16 would require the development of emission thresholds and ERPs, if those thresholds are exceeded. As discussed in Section IV, Biological Resources and Section V, Cultural Resources, no significant adverse impacts are expected to biological or cultural resources, as any construction activities are expected to remain within the confines of existing refineries, which have already been graded and developed.

**XVIII. b and c).** Rule 12-15 requires recordkeeping and monitoring, while Rule 12-16 requires the development of emission thresholds and ERPs, if those thresholds are exceeded. The proposed project could require construction and installation of new air pollution control equipment which could result in secondary air emissions as well as additional GHG emissions. Therefore, the potential health and cumulative impacts associated with implementation of Rules 12-15 and 12-16 will be evaluated in the Draft EIR.

The 2010 CAP includes measures to reduce criteria pollutants, toxic air contaminants, and GHG emissions and estimates that implementation of the 2010 CAP would result in a reduction of over 15,000 metric tons per day or over five million metric tons per year (BAAQMD, 2010). Therefore, implementation of Rules 12-15 and 12-16, in connection with other 2010 CAP measures, is not expected to be cumulatively significant. Nonetheless, the project-specific impacts of Rules 12-15 and 12-16 on air quality and GHG emissions will be evaluated in the Draft EIR.



## Chapter 3

### References

Association of Bay Area Governments, 2006. Projections 2007, December 2006.

BAAQMD, 2010. Bay Area 2010 Clean Air Action Plan, September 15, 2010.

Metropolitan Transportation Commission (MTC), 2013. Environmental Impact Report Plan Bay Area Draft. Metropolitan Transportation Commission and Bay Area Association of Governments. April, 2013.



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March 27, 2015

**Via Electronic Mail and U.S. Mail**

Mr. Eric Stevenson  
Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, CA 94109

Re: Comments on February 2015 Initial Study/Notice of Preparation for  
Proposed Rules 12-15 and 12-16

Dear Mr. Stevenson:

We have been retained by the Western States Petroleum Association (“WSPA”) to provide comments on the Bay Area Air Quality Management District’s February 2015 Initial Study and Notice of Preparation of an Environmental Impact Report (IS/NOP) for proposed Regulations 12-15 and 12-16. Our review of the IS/NOP has identified several areas of potential environmental impact for which the District concluded that a significant impact would not occur, but which should be addressed in the Environmental Impact Report to be prepared in connection with the District’s consideration of the proposed regulations. Our comments are provided in the enclosed table.

WSPA appreciates your consideration of these comments. Please feel free to contact me or Guy Bjerke (925-826-5354) if you would like to discuss these issues in more detail.

Very truly yours,

David R. Farabee

Enc.

cc: Mr. Guy Bjerke

## Enclosure

### WSPA Comments on February 2015 CEQA Initial Study/Notice of Preparation for Proposed Regulations 12-15 and 12-16

Section	Page	Comment
<b>Project Description</b>	1-1, 1-7, 1-11	The Initial Study (IS) should better explain how Rule 12-16 would allow the District to identify a potential relationship between emissions and crude oil quality (if there is such a relationship).
	1-1, 1-7, 1-8, 1-10	In multiple places, the language in the IS links increased emissions with changes in crude oil composition despite no evidence that an change in crude oil composition increases emissions.
<b>Aesthetics</b>	2-6 – 2-7	The project could affect checklist item c) “Substantially degrade the existing visual character or quality of the site and its surroundings”. The checklist lists this item as less than significant. The possibility that a project will degrade the visual quality of a site and its surroundings must be evaluated, assuming the particular types of emission control devices that a refinery might add to reduce emissions below the trigger levels. How those devices would impact the visual character of the refinery should be part of that analysis. In addition, the Rules would require fence-line and community monitors which would be visible from surrounding properties. Thus, even though refineries are in industrial areas, there still could be significant aesthetic impacts to surrounding areas. The IS states that these additions are not expected to be taller than existing refinery structures, but that does not address how big they will be or whether they will degrade the quality of the site. Some, if not all, community monitors would be located in or adjacent to residential areas and would be visible from nearby properties. Depending on their size and location, these monitors could result in significant impacts to local aesthetics. Thus, this impact should be addressed in the Draft Environmental Impact Report (DEIR).
	2-6 – 2-7	The project could affect checklist item d) “Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area”. The checklist lists this item as less than significant. Refinery modifications to install control equipment may require additional lighting. It is unknown whether this lighting would have a significant impact and thus this potential impact should be analyzed in the DEIR.

Section	Page	Comment
<b>Geology and Soils</b>	2-21	<p>The IS states that compliance with the California Building Code would minimize the impacts associated with existing geological hazards. However, compliance with the CBC does not guarantee that an impact will be less than significant. An analysis of the specific geological features of the location in which the Project will occur is required to determine whether any significant impacts due to geology and soil may occur. For example, it is unknown whether certain refineries that will be subject to the District’s rules are in earthquake fault zones, areas at risk for liquefaction, or areas at risk for erosion. Thus, the impact area should be studied in the DEIR.</p>
<b>Greenhouse Gases</b>	2-24	<p>The project could have a potential impact related to checklist item b) “Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases”. The IS states that Rule 12-16 will exempt GHG emissions from the emission reduction requirements of ERP to avoid confusion and potential conflict with CARB’s cap and trade program. However, other portions of the IS explain that emission control measures used to meet the requirements of Rule 12-16 may cause an increase in GHG emissions. The IS does not explain how this increase will not lead to a conflict with applicable plans, policies, or regulations (such as the AB 32 Scoping Plan).</p> <p>As part of the analysis of potential GHG impacts, the District must consider the possibility of increased GHG emissions outside of the Bay Area or California if the proposed rules limit the refineries’ ability to use their existing refining capacity to meet the demand for fuels and other petroleum products, or if the rules lead to the shutdown of one or more of the Bay Area refineries. Import of fuel to the Bay Area could have higher total GHG emissions than local production due to different regulatory requirements and emissions resulting from additional transportation of refined products.</p>
<b>Hazards and Hazardous Materials</b>	2-26	<p>The discussion of risk and potential hazards associated with petroleum refineries could be presented in a way that does not portray these activities as inherently very risky. The IS describes potential risks from petroleum refining but does not directly state that these risks are significantly minimized by applicable regulations and rules.</p>

Section	Page	Comment
<b>Hydrology and Water Quality</b>	2-32	It is unclear why the Project would potentially have a significant impact for item f) “Otherwise substantially degrade water quality”. The IS notes that any additional wastewater would be subject to water quality standards or waste discharge requirements. Compliance with these requirements should be sufficient to lower this impact to a less than significant level.
<b>Land Use and Planning</b>	2-34	The IS states that the Project would have no impact related to item b) “Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project...” It is not clear that this is the case. The IS does not address whether the installation of air monitors or other emission reduction devices has the potential to conflict with local general plan policies or goals. Even though the land within refineries is typically zoned for industrial use, it is not clear that any modification within that area would necessarily be consistent with local general plans and this can only be determined by reviewing such plans. Similarly, the potential that the siting and operation of community air monitors would be inconsistent with local planning and zoning requirements must be described and evaluated. Thus, this topic should be discussed in the DEIR.
<b>General</b>		The DEIR must assess the possibility that the proposed rules would make continued operation of one or more of the five Bay Area refineries uneconomic, leading to a facility shutdown. Such a shutdown could have multiple potential environmental impacts, such as changes in job distribution and commute/traffic patterns, air quality and GHG impacts resulting from refining and transport of fuels from outside the Bay Area, and aesthetic impacts from the shutdown of large industrial facilities. These potential impacts must be studied in the DEIR.

## **Response to Comments**

The following responds to the comments provided by David Farabee of Pillsbury on March 27, 2015 on behalf of WSPA on the Initial Study/Notice of Preparation for Proposed Regulations 12-15 and 12-16.

### **Project Description**

Please see Chapter 2 of the Draft EIR, Section 2.4.2.1 for a more detailed project description. Rule 12-15 would require refineries to track and monitor criteria and toxic air contaminants on an annual basis. The rule would also require refineries to report their crude slate and pre-processed feedstocks for specific characteristics, such as sulfur and nitrogen content, API gravity, total acid number, etc. By tracking emissions as well as crude and feedstock characteristics, the District would be able to determine the relationship between crude slate and refinery emissions.

### **Aesthetics**

The potential impacts associated with community and fenceline monitors were addressed in the NOP/IS and concluded to be less than significant. The fenceline monitors would be within the refinery boundaries and are expected to be approximately the same height as the existing fences and would be compatible with the existing industrial structures within the Refinery. Community air monitors are also required under Rule 12-15 and would be placed near each refinery. The community monitors may or may not be visible to the community, depending on their location. If a community monitor is placed on an existing building/structure it is not likely to be visible to the community. At some locations, a portable trailer may be used for monitoring, which would also require security fencing to protect the monitoring station. In this case, the monitoring station could be visible to the community, but the height of the monitoring station is expected to be eight to ten feet which would be the height of existing single family dwellings and would be the size of a small trailer. Therefore, aesthetic impacts associated with fenceline and community monitors are considered to be less than significant.

Proposed Rule 12-16 could require air pollution control equipment on various refinery sources, (e.g. boilers and heaters.). The types of control equipment that may be required at a refinery is evaluated in Chapter 2 (Section 2.5) of the Draft EIR. These emission controls could lead to changes in operations, replacement of old equipment with new equipment, or installation of new air pollution control devices. Measures that may be taken to reduce emissions include changes in operations and replacement of old equipment with new equipment (e.g., new ICEs) would have no impact on aesthetics and would not change the visual character of the refineries. Most of the new air pollution control equipment would not be large and would not be visible to the surrounding community because of their size and height, e.g., diesel particulate filters, flue gas treatment, SO<sub>x</sub> reducing additives, and diesel Oxidation Catalyst. Of the equipment that may be required as a result of the proposed rules, a wet gas scrubber would be expected to require the tallest structures with a stack that may be up to about 200 feet tall. All of the existing refineries have hundreds of columns, vessels, flares, stacks, tanks and other structures, many of which exceed 150 feet in height. The addition of one more stack is not expected to degrade the visual

character of the areas. Any new equipment would be located within the refineries, would be compatible with the industrial nature of the refineries, would not be expected to block any scenic vista, degrade the visual character or quality of the area, or result in any adverse aesthetic impacts. Once implemented, equipment associated with the new rule is not expected to be noticeably visible within the refineries. Therefore, the proposed new rules are not expected to have adverse aesthetic impacts to the surrounding community.

## **Geology and Soils**

The comment appears to confuse hazards associated with the proposed project (the potential installation of new air pollution control equipment) with existing geological hazards. The NOP/IS recognized that the San Francisco Bay area is a geological active area with a number of existing faults. The existing refineries are currently subject to groundshaking and the related impacts to the existing refining structures (tanks, columns vessels, pipelines, etc.). The impacts associated with the proposed project would be limited to the construction of air pollution control equipment which is very small equipment in comparison to the existing refining structures such as FCCUs, Cogeneration Plants, Hydrogen Units, Coker Units, Crude Units, etc.

A summary of the EXISTING geological hazards associated with the five refineries is summarized below. The data is from the Contra Costa Internet GIS Map.

1. Chevron Richmond: The portions of the refinery immediately adjacent to the Bay are identified as areas subject to liquefaction. A landslide area is noted in the upper portions of the hill. No faults are identified in the immediate area of the refinery.
2. Shell Martinez: The portions of the refinery immediately adjacent to the Bay are identified as areas subject to liquefaction. Generally areas southwest of Highway 680 are not subject to liquefaction, which is where the operating portion of the refinery is located. A portion of the Concord fault is located east of Highway 680 and east of the Shell Refinery. A portion of the Southhampton fault is located west of the refinery. No landslides have been identified in the vicinity of the refinery.
3. Tesoro Martinez: The portions of the refinery immediately adjacent to the Bay are identified as areas subject to liquefaction. The operating refinery is generally located outside of the areas subject to liquefaction. A portion of the Concord fault is located east of Highway 680 and west of the Tesoro Refinery. A portion of the Southhampton fault is located west of the refinery. No landslides have been identified in the vicinity of the refinery.
4. Valero Benicia: The operating portions of the refinery are not subject to liquefaction. The refinery is located west of the Concord fault and east of the Southhampton fault. No landslides have been identified in the vicinity of the refinery.
5. Phillips 66 Rodeo: Areas along the northeastern and southwestern boundaries of the refinery may be subject to liquefaction. The Franklin fault is located east of the refinery. No landslides have been identified in the vicinity of the refinery.

While there are existing geological hazards in the vicinity of the refineries, there is extensive development within and surrounding the refineries and the areas have been urbanized.

Development within geologically active areas is protected by developing structures in compliance with the California Building Codes.

Any construction activities associated with air pollution control equipment would occur within the confines of existing refineries and would be required to comply with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. Any construction at industrial facilities regulated by the new rule will be constructed in compliance with the California Building Code. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code basis seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards.

Any new development at the petroleum refineries affected by the new rule would be required to obtain building permits, as applicable, for new foundations and structures at any site. The issuance of building permits from the local agency will assure compliance with the California Building Code, which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since the construction of any new structures would be required to comply with the California Building Code.

### **Greenhouse Gases**

See Section 3.3 of the EIR for the evaluation of the potential GHG impacts associated with the proposed new rules, as well as a discussion of applicable rules and regulations. Construction activities associated with installation of new air pollution control equipment and the operation of the new equipment could require additional energy (e.g., electricity) and generate additional GHG emissions. These potential emission increases were evaluated in Section 3.3 of the EIR.

The possibility that the proposed rules could lead to the shutdown of an existing refinery is speculative. Per CEQA guidelines 15126.6(f)(3) "(a)n EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." Therefore, the potential shutdown of an existing refinery was not evaluated because it is speculative. In addition, the Socio-Economic Analysis of the impact from these rules finds estimated annualized costs-to-net profit ratio ranges from 1.5 percent to 2.7 percent. As a result, impacts are judged to be less than significant, and therefore unlikely to result in shutdown of an existing refinery.

The possibility of increased GHG emissions due to production shifting as a result of the proposed rules is also remote and speculative. It is possible that one or more refineries may elect to meet possible emission reduction requirements through curtailing production. However, the



most likely scenario is that the production will be made up by refineries in the Bay Area or in California since those refineries can use existing distribution networks to deliver the product. According to the Energy Information Administration, West Coast refineries are currently operating with at least 10 percent excess capacity on average. So, there should be sufficient unused capacity in California to meet any demand. In addition, California refineries are already producing products that meet California-specific requirements for gasoline and diesel. Any increase in GHG from a California refinery would be offset under the AB32 Cap and Trade program. Considering all of these factors, this possibility is too remote and speculative to merit consideration in the EIR.

### **Hazards and Hazardous Materials**

The Draft EIR evaluates the potential hazards associated with the proposed project, i.e., the potential hazards associated with new air pollution control equipment. The baseline or existing setting is the hazards associated with the current operations at the refineries. See Section 3.4 of the Draft EIR for the evaluation of the potential hazard impacts associated with the proposed new rules, as well as a discussion of applicable rules and regulations.

### **Hydrology and Water Quality**

The initial study concluded that the operation of new air pollution control equipment (e.g., wet gas scrubbers) could generate potentially significant impacts. This is because wet gas scrubbers can use large volumes of water and result in increased wastewater discharges. The water demand and water quality impacts were evaluated in the Draft EIR. See Section 3.5 of the EIR for the evaluation of the potential hydrology and water quality impacts associated with the proposed new rules, as well as a discussion of applicable rules and regulations.

### **Land Use and Planning**

All of the General Plan and land use plans for Richmond, Martinez, Benicia and Rodeo (Contra Costa County) allow for and encourage the continued use of industrial areas within their respective communities. Some of the General Plans encourage the modernization of existing industrial areas, including the refineries. A summary of the land use policies that apply to industrial areas is summarized for each community that the five Bay Area refineries are located.

1. Richmond General Plan 2030 includes the following land use policies regarding industrial areas. (<http://www.ci.richmond.ca.us/DocumentCenter/Home/View/8809>)
  - Action LU3.H Industrial Lands Retention and Consolidation Ensure that industrial uses are consolidated around rail and port facilities and work with existing industrial operators, economists and commercial brokers to remain informed about the future demand for industrial land.
  - Action LU3.I Industrial Modernization Support heavy industry's on-going efforts to modernize and upgrade their plants to reduce energy use, increase efficiency and reduce emissions.

2. City of Martinez General Plan includes the following land use policies regarding industrial areas. (<http://www.cityofmartinez.org/civicax/filebank/blobdload.aspx?BlobID=7569>)
  - 21.51 Expansion of the petroleum refining and related industries must proceed in an orderly fashion and be consistent with protection of the community's air, water, scenic and fiscal resources.
  - 30.351 Adequate land for industrial growth and development should be provided. It is the policy of the City to encourage and assist existing industry to relocate away from the southern perimeter of the waterfront.
  - 30.352 The City should consider further annexation to the east of the current Martinez City Limits to provide space for expansion of industry.
  - 30.353 Industrial expansion accompanied by adverse environmental impact will not be permitted.
  - 30.354 Acceptability of any industry shall be based upon its demonstrated ability to conform to performance standards set by the City.
  - 30.355 Architecture of some merit and landscaping of building sites and parking areas should be required; according to design and landscaping criteria for industrial sites.
  
3. City of Benicia General Plan includes the following land use policies regarding industrial areas. ([http://www.ci.benicia.ca.us/index.asp?Type=B\\_BASIC&SEC={4961C62F-22A5-4BB7-B402-D050A5856B00}&DE={8874E99E-FF86-45FF-8F9D-FAC81A3022A5}](http://www.ci.benicia.ca.us/index.asp?Type=B_BASIC&SEC={4961C62F-22A5-4BB7-B402-D050A5856B00}&DE={8874E99E-FF86-45FF-8F9D-FAC81A3022A5})). The City's Goal 2.6 is to Attract and retain a balance of different kinds of industrial uses to Benicia. The following land use policies and programs implement Goal 2.6.
  - **POLICY 2.6.1:** Preserve industrial land for industrial purposes and certain compatible "service commercial" and ancillary on-site retail uses.
  - "Compatible," as defined in the California General Plan Glossary, means "capable of existing together without conflict or detrimental effects." Compatibility will often be decided on a case-by-case basis by the Planning Commission and City Council.
  - **POLICY 2.6.2:** Other land uses should not adversely affect existing industrial and commercial land uses.
  - Program 2.6.A: Where General Plan amendments propose to convert industrial land to non-industrial or non-commercial uses, require the preparation of a fiscal and economic impact analysis to ensure that the conversion does not adversely affect the city's longterm economic development, or the economic vitality of existing industrial/commercial uses.
  - Program 2.6.B: Develop criteria for evaluating whether a proposed non-industrial/non-commercial use would impact the viability of existing industrial/commercial uses. Use the criteria to evaluate non-industrial and non-commercial projects proposed in the Industrial Park.
  - **POLICY 2.6.3:** Facilitate continued development of the Industrial Park. Especially encourage general industrial uses to locate in the basin northeast of Downtown (around Industrial Way between East Second and the freeway).
  - Program 2.6.C: For lands designated limited industrial, reduce the length of time and number of steps required for development proposals to proceed, consistent with CEQA,

community development policies and ordinances, and the design review process for general industrial lands.

- **POLICY 2.6.4:** Link any expansion of Industrial land use to the provision of infrastructure and public services that are to be developed and in place prior to the expansion.
  - Program 2.6.D: Continue to update the overall capital improvements program and infrastructure financing plan for the Industrial Park and other major industrial areas.
  - Program 2.6.E: Develop Industrial Park infrastructure and public services standards, as approved by the City Council.
  - **POLICY 2.6.5:** Establish and maintain a land buffer between industrial/commercial uses and existing and future residential uses for reasons of health, safety, and quality of life.
  - Program 2.6.F: Use topography, landscaping, and distance as a buffer between Industrial Park uses and residential uses.
  - A buffer is “adequate” to the extent that it physically and psychologically separates uses or properties so as to shield, reduce, or block one set of properties from noise, light, or other nuisances generated on or by the other set of properties. Buffers will be determined on a case by case basis.
4. Rodeo: The Contra Costa General Plan Land Use Element identifies the following land use policies (<http://www.co.contra-costa.ca.us/4732/General-Plan>)
- 3.163. A buffer of agricultural lands around the eastern Union Oil (currently Phillips 66) property is created in this plan to separate the viewpoint residential area from future industrial development on the property. These open space lands should remain undeveloped.

Based on a review of the applicable land use plans, the construction of additional air pollution control equipment within the confines of existing refineries is not expected to conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project. All of the jurisdictions with land use approval recognize and support the continued use of industrial facilities. The construction of additional air pollution control equipment would not interfere with those policies or objectives.

## General

The possibility that the proposed rules could lead to the shutdown of an existing refinery is speculative. Per CEQA guidelines 15126.6(f)(3) “(a)n EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.” Therefore, the potential shutdown of an existing refinery was not evaluated as an alternative because it is speculative. In addition, the Socio-Economic Analysis of the impact from these rules finds estimated annualized costs-to-net profit ratio ranges from 1.5 percent to 2.7 percent. As a result, impacts are judged to be less than significant, and therefore unlikely to result in shutdown of an existing refinery.