

CHAPTER 2

Description of the Proposed Rule

2.1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD or District) is proposing a new rule that would apply to petroleum refineries located in the San Francisco Bay Area. The proposed new rule is Regulation 12, Rule 15 (Regulation 12-15): Petroleum Refining Emissions Tracking (herein “Tracking Rule”).

Rule 12-15 would require that all Bay Area refineries:

1. Provide consistent, enhanced periodic emissions inventory information, including information about cargo carriers;
2. Provide historical and ongoing crude slate information, including volumes and composition data, for imported pre-processed feedstocks as well as for crude oil; and
3. Install and operate new air monitoring facilities at refinery fence lines.

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 Regulation 12-15 would affect five refineries within the Bay Area:

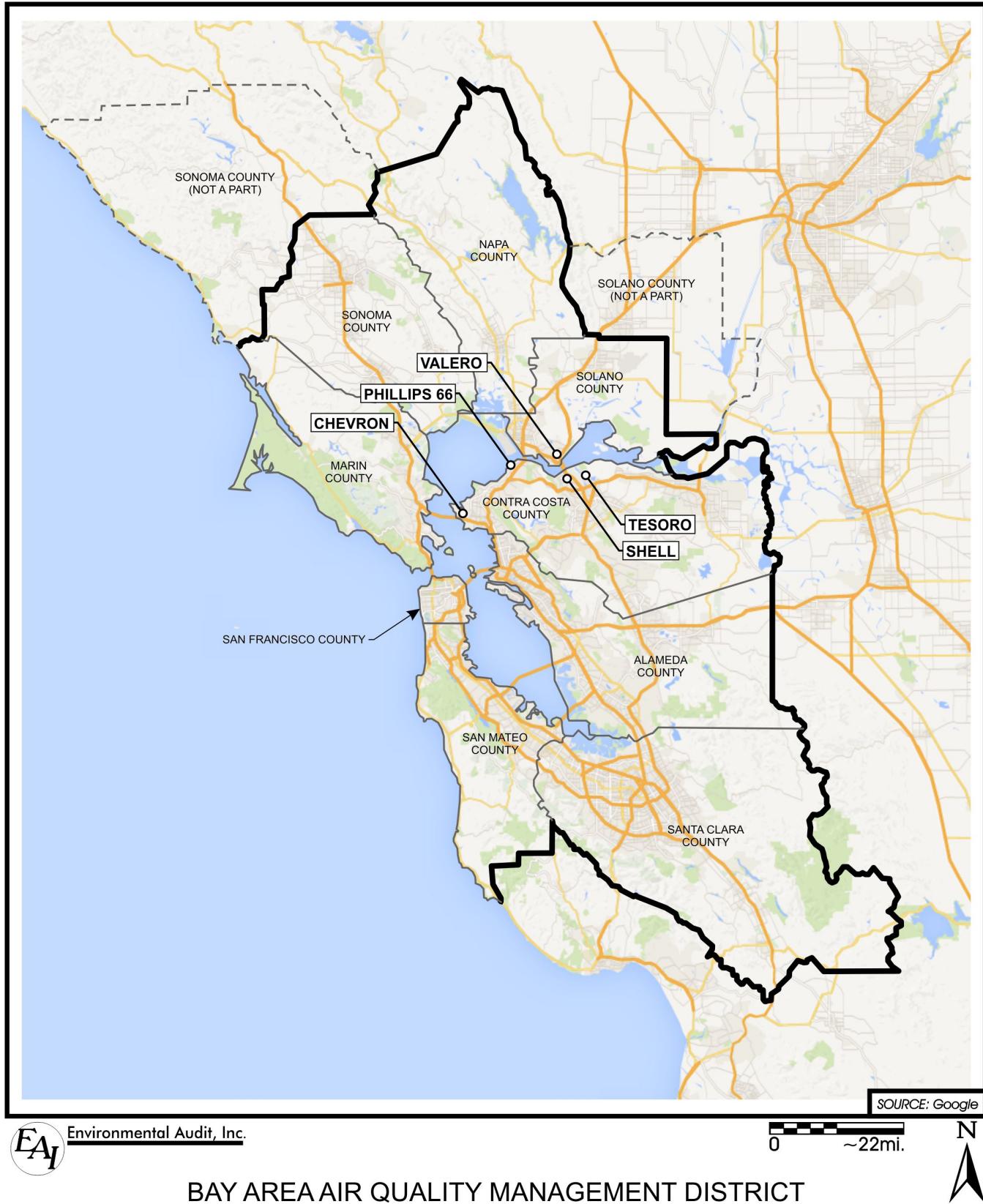
1. Chevron Products Company, Richmond (BAAQMD Plant #10)
2. Phillips 66 Company—San Francisco Refinery, Rodeo (BAAQMD Plant #21359)
3. Shell Martinez Refinery, Martinez (BAAQMD Plant #11)
4. Tesoro Refining and Marketing Company, Martinez (BAAQMD Plant #14628)
5. Valero Refining Company—California, Benicia (BAAQMD Plant #12626)

Regulation 12-15 would also apply to five refinery-related facilities (“support facilities” in the draft rule):

1. Chemtrade West sulfuric acid plant, Richmond (BAAQMD Plant #23)
2. Eco Services sulfuric acid plant, Martinez (BAAQMD Plant #22789)

3. Air Products and Chemicals hydrogen plant, Martinez (BAAQMD Plant #10295)
4. Air Liquide hydrogen plant, Rodeo (BAAQMD Plant #17419)
5. Phillips 66 coke calcining plant, Rodeo (BAAQMD Plant #21360)

These five support facilities are included in the rule because their operation is closely linked to the operations of the five refineries and because they are significant sources of air pollutants. Support facilities would be subject only to emissions inventory requirements and would not be required to install or operate air monitoring systems.



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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

2.3 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 (PM10) or PM2.5. 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 rule is for the District to gather additional emissions inventory and crude slate information from refineries and increase air monitoring activities at refinery fence lines.

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 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.
- Provide information to the public on refinery emissions and significant crude slate changes.

2.4 BACKGROUND

The District is proposing Regulation 12-15, the details of which are summarized in this subsection. The specific proposed rule is included in Appendix A of this Negative Declaration.

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

1. Chevron Products Company, Richmond (BAAQMD Plant #10)
2. Phillips 66 Company—San Francisco Refinery, Rodeo (BAAQMD Plant #21359)
3. Shell Martinez Refinery, Martinez (BAAQMD Plant #11)
4. Tesoro Refining and Marketing Company, Martinez (BAAQMD Plant #14628)
5. Valero Refining Company—California, Benicia (BAAQMD Plant #12626)

Regulation 12-15 would also apply to five refinery-related facilities ("support facilities" in the draft rule):

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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).

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 (TACs); and (3) greenhouse gas emissions (GHGs). 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_2) and oxides of nitrogen (NO_x); (3) PM_{10} ; and $\text{PM}_{2.5}$; (4) volatile organic compounds (VOC); and SO_2 . Each of these criteria pollutants are emitted by petroleum refineries.

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_2), methane (CH_4), nitrous oxide (N_2O), and three groups of fluorinated compounds (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)), and are the major anthropogenic GHGs. GHGs emitted from petroleum refineries include CO_2 , CH_4 and N_2O .

The proposed regulatory approach for Regulation 12-15 is as follows:

- Report on-going annual emissions inventories of all regulated air pollutants based on consistent upgraded methods, including emissions from cargo carriers;
- Provide volumes and characteristics of crude oil and other pre-processed feedstock with annual emissions inventories, as well as historic crude oil and feedstock data; and
- Establish new fence-line air monitoring systems.

2.5 PROJECT DESCRIPTION

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.

2.5.1 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 the proposed rule. The definition of TAC 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 health risks. 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 (PM2.5), a covered criteria pollutant).

2.5.2 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 in which 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 are included in the requirements of the rule. This concept is addressed in the definition of “emissions inventory” in the proposed rule. Several other definitions in the proposed rule are intended to clarify source coverage. This includes the definition of “petroleum refinery”, the definition of “source”, and the definition of “emissions inventory.”

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).

Processing crude oil from new sources may result in increased emissions. As a result, the draft Tracking Rule would require that each refinery provide its “crude slate” as defined in the proposed rule, including sulfur, API gravity, and other specified properties. By gathering this information about crude oil and other feedstocks fed into the refinery processes, the Air District will be better able to evaluate the emissions impact of changing crude slates and take appropriate actions.

2.5.3 ADMINISTRATIVE REQUIREMENTS

The proposed Tracking Rule would require refinery owner/operators to submit to the BAAQMD various reports and plans that would be 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.

2.5.3.1 Emissions Inventories

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. 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. The proposed rule requires that emissions inventories submitted under the rule must be prepared following District-published guidelines.

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).

2.5.3.2 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 refined, blended, or processed at other process units;
- API gravity as it relates to higher crude density;
- Sulfur content;
- Vapor pressure;
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) contents; and
- Selected metals (nickel, vanadium, and iron) content.

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

2.5.4 MONITORING REQUIREMENTS

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. The term “fence-line monitoring system” is defined in the proposed rule. The air monitoring plans would need to be prepared in accordance with air monitoring guidelines that are published by the District.

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. The systems would be installed, operated, and maintained, in accordance with the approved plan.

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.

2.6 AFFECTED AREA

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

BAAQMD proposes to regulate criteria pollutants, GHG, and TAC from the five Bay Area refineries and associated facilities. The equipment affected by the proposed project are located within the jurisdiction of the Bay Area Air Quality Management District (see Figure 2.2-1).