COMMUNITIES FOR A BETTER ENVIRONMENT

BY ELECTRONIC MAIL

11 September 2016

Greg Nudd, Manager
Rule Development Section
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Re: **Draft Project Description for Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits and Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities [August 2016 Version]**

Dear Rule Development Manager Nudd,

As a preliminary matter, Communities for a Better Environment (CBE) appreciates the Air District Staff's cooperation with us since late July in updating the Air District data that emission limits in Rule 12-16 will be based upon. We understand from discussion with you Friday that updated and complete current emissions data relevant to Rule 12-16 are expected to be made available for consideration during the fall of 2016.

Thank you for this opportunity to comment on the Draft project description cited above (Draft). These comments address the accuracy and completeness of the Draft. Several revisions are needed to correct significant errors in the Draft project description.

Comment 1. The Draft does not describe the Air District role in developing Rule 12-16 accurately. The Air District's public process for developing this measure spans four years. District records show that the Air District found refineries are major air polluters, found that changes in oil feed quality could increase refinery emissions significantly, resolved to develop a "backstop" against those increases, and directed the development of the numeric emission limits that provide for this backstop in proposed Rule 12-16. CBE, the largest refinery workers union local in the region, and many other members of the public participated actively throughout this rule development process. CBE is concerned that the omission of these facts from the project description would not support a complete and accurate analysis of the proposal. We respectfully offer specific language revisions that correct these omissions and inaccuracies in the "suggested revisions to the draft project description" text attached to these comments. *See* proposed revised § 1.1.

Comment 2. The Draft does not describe the potential for air pollutant accumulation in the region accurately because it omits source location, source strength, and the interaction of these factors with climatic and topographic factors on short and seasonal time scales from its description of the project setting. This is important descriptive information because all of these factors in combination can and do increase the potential for air

pollutant accumulation on environmentally relevant time scales in areas the Draft does not identify—those near strong emission sources such as refineries, and other areas outside the region's inland valleys. We suggest specific language to correct this inaccuracy in the attached revisions. *See* § 1.3.

Comment 3. Information that provides necessary context for understanding the proposal is omitted from the Draft's "background" section. Specifically: The Air District has found that GHGs and certain criteria pollutants, especially fine and ultra-fine particulate matter, need to be reduced to protect public health and the climate. NOx and SO_2 are PM precursors. The global warming potential of GHGs is measured by established global scientific convention and by proposed Rule 12-16 as carbon dioxide equivalents (CO_2e). The Air District has found refineries are major sources of GHGs, PM_{10}, $PM_{2.5}$, NOx, and SO_2, and that changes in refinery oil feed quality, among other factors, have the potential to increase refinery emissions significantly. Changing oil feed quality also can result in water quality, hazard, and public and worker safety impacts by increasing refiners' toxic discharges and increasing the frequency and magnitude of chemical spill, fire, and explosion incidents involving refineries and associated facilities and cargo operations. Demonstrating compliance with the specific emission limits proposed in Rule 12-16, which are designed to allow each facility's current emissions, need not require any new action other than comparing emission monitoring results to each limit, while at the same time it would ensure that GHG and particulate air pollution from refineries will not increase significantly. These facts provide necessary context and should be reported.

Moreover, by comparing rules that address different sets of sources and pollutants before presenting background on the pollutants, sources emitting them, and strengths of those sources, the Draft would add to the confusion created by the omission of facts cited above that are relevant to these differences. The Draft also says Rule 12-16 would apply to emissions from shutdown, startup, and malfunction conditions but omits that it would not apply to flaring.[1] This omits necessary context, since these same conditions can result in flare emissions (excluded from this rule) as well as other emissions covered by this rule.

We suggest specific revisions to solve these problems. *See* revised § 1.4, attached.

Comment 4. Project objectives are not stated specifically and explicitly in the Draft. Failure to correct this omission would represent a serious error in the EIR. The needed information is available for Rule 12-16, as CBE's 5 August 2016 letter shows. CBE renews our recommendation to include these Rule 12-16 objectives in the project description, and suggests revisions to do so herein. *See* new § 1.5.1.1, attached.

Comment 5. In addition to the need to specify project objectives, the accuracy of the Draft's project description can be improved significantly by revisions to:

- Explain that refinery fuel combustion emits methane as well as CO_2 and N_2O;
- Explain that the source strength of these GHGs would be limited as CO_2e;

[1] Flaring is an essential emergency safety operation already controlled by Rule 12-12.

- Define, at least generally for non-experts, the terms, UFPM, $PM_{2.5}$, and PM_{10};
- Include oil refineries among the important sources of PM it highlights; and
- Explain that two other pollutants which would be limited by proposed Rule 12-16 in addition to PM_{10} and $PM_{2.5}$—NOx and SO_2—are PM precursors.

Specific suggestions for curing these omissions and inaccuracies are included in the attached revised Draft language. *See* proposed revised § 1.5.1.2 (Draft § 1.5.1.1).

Comment 6. The Draft project description is incomplete because it does not describe or define the term "refinery support facility." The Air District described and defined this term in documents supporting Rule 12-15 and previous versions of proposed Rule 12-16. A specific suggestion to resolve this problem is attached hereto. *See* proposed revised § 1.5.1.3 (Draft § 1.5.1.2).

Comment 7. Draft Table 1 properly presents draft numeric information about the proposed Rule 12-16 emissions limits, however, it obscures context for interpreting this uniquely specific presentation of that information in the project description, because of categorization errors in the table's notes. Notes in the table should reference the correct column(s) or row(s) of numeric data to which the explanation in each note applies. *See* notes "a" through "c" in the suggested correction to Table 1 that is attached hereto.

Comment 8. The Draft omits one of the intended effects of the "Changes in Monitoring Methods" provision in Rule 12-16. In addition to ensuring consistent compliance with emission limits as stated in the Draft, this provision would have the effect of encouraging future improvements in emissions measurement and monitoring. A suggested revision stating both effects of the provision is included in the attached revisions. *See* proposed revised § 1.5.1.5 (Draft § 1.5.1.4).

Comment 9. The Draft does not provide an adequate project description to fully assess environmental effects because it does not describe the implementation of the proposed rules. Beneficial effects are anticipated from implementing the rules; unintended effects, should they occur, might also result from implementing them. Implementation—which can be expected to differ from one rule to another both in terms of the actions to be taken and the timing of those actions—thus needs to be described in order to assess potential impacts fully. The omission of this needed information from the Draft can be cured, for proposed Rule 12-16, as shown specifically in our suggested revisions attached hereto. *See* proposed new § 1.5.1.6.

Comment 10. The Draft does not describe the objectives or implementation of proposed Rule 11-18 explicitly or specifically, and, in contrast to proposed Rule 12-16, this information is not yet available to the public from other sources. Without this specific information, it is difficult at best to know what other information will be necessary to describe the Rule 11-18 "project" adequately so that a complete, accurate, and reliable environmental impact analysis of proposed Rule 11-18 can be prepared and reviewed. Accordingly, CBE reserves the right to comment on these matters as more information becomes available.

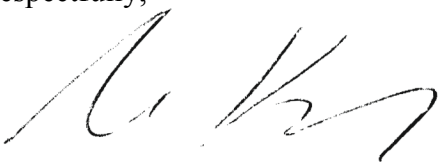
Conclusion

CBE urges the Air District to correct all of these omissions and inaccuracies in the Draft project description so that the development of proposed Rule 12-16 can be completed and this urgently needed measure can be considered for adoption as expeditiously as possible. District Staff agrees, we understand from our discussion Friday, that its unfinished work on the Notice of Preparation and Initial Study can and should proceed without further delay in parallel with its work to include updated and complete current emissions data.

We look forward to reviewing the complete, updated Air District Emission Inventory data that we understand the Staff anticipates providing next week pursuant to CBE's public records request. In that regard, to support transparency and full public review, CBE requests that this updated electronic data file be posted along with the rest of the Rule 12-16 development record on the Air District's website.

Please contact us if you have a question about these comments.

Respectfully,



Greg Karras
Senior Scientist

Roger Lin
Staff Attorney

Attachment: Suggested Revisions to the Draft Project Description

Copy: Jack Broadbent, BAAQMD
Victor Douglas, BAAQMD
Eric Stevenson, BAAQMD
Luz Gomez, BAAQMD
Refinery Action Collaborative of Northern California
BAAQMD Network organizations
Interested organizations and individuals

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

Petroleum refineries are significant sources of harmful pollutants on both the global (greenhouse gases) and local scale (toxic air contaminants and criteria pollutants). Many Bay Area residents have expressed concern about the impact of this pollution on the environment and public health. Though refinery emissions have declined over time, it is possible that as refinery operations change in the future, emissions of these pollutants could increase.

In response to these concerns, the Board of Directors of the Bay Area Air Quality Management District (Air District) has directed staff to bring forward two draft rules for their consideration~~, one that reflects policy recommended by some environmental advocacy organizations, and an approach recommended by Air District staff~~.

~~Communities for a Better Environment (CBE) and several associated organizations have recommended that the Air District adopt new~~ Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16 or "~~Refining~~ Refinery Emission Caps Rule"~~). This rule~~ would set numeric limits on specific refinery emissions. Rule 12-16 would apply ~~only~~ to ~~the Bay Area's~~ five petroleum refineries and three facilities associated with the refineries. The Air District has developed this control measure in a public process over four years. Information developed in this process has been made available on the District's website with previous proposals for rules 12-15 and 12-16, and can be accessed at [insert web link.] In brief summary:

- The District published a Concept Paper in 2012 that found the potential for refinery emissions to increase due to changes in oil feed quality or other causes and that Bay Area refineries currently lack facility-wide mass emission limits, and proposed to develop a new rule that would address these concerns;
- District Resolution 14-7, adopted in 2014, found the potential for changes in oil feed quality to increase refinery emissions significantly and directed District Staff to take several complementary actions, including the development of Rule 12-16 to provide a "backstop" against increasing refinery emissions, and the development of separate rules to reduce refinery emissions from selected specific refinery sources and operations;
- In June and July 2016 the District Board directed Staff to develop enforceable numeric mass limits on refinery-wide emissions of specific air pollutants that cause climate impacts and particulate air pollution in new proposed Rule 12-16, and a full analysis of this measure that will allow the Board to consider properly adopting it "as expeditiously as possible" and no later than May 2017; and
- Members of the public, refiners and their trade groups, and community, environmental, refinery worker and other organizations, including but not limited to Communities for a Better Environment and United Steelworkers Local 5, participated actively in this rule development process since 2012 and cooperated in the development of the specific limits proposed for adoption in Rule 12-15.

~~The staff of the Air District has developed a different approach that directly addresses concerns about health risks to the refinery communities. The staff recommendation is that the Air District adopt a new~~ Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18 or "Toxic Risk Reduction Rule"). ~~Rule 11-18~~ would apply to all facilities whose emissions of toxic air contaminants may result in a significant risk to nearby residents and workers. ~~This~~ Rule 11-18 would apply to ~~include~~ petroleum refineries as well as many other facilities in the region. The purpose of 11-18 is to set toxic air contaminant caps for those facilities causing the highest health impacts across the bay area and to require these facilities to reduce that health risk.

Because the Board of Directors of the Air District intends to consider these rules within the same timeframe, staff is preparing one Environmental Impact Report to cover both rules. The intent of the single EIR is to ensure that all of the potential environmental impacts for both rules are considered and comprehensively addressed. Although they are being considered at the same time and both would affect refineries, the two rules are functionally independent. Adoption of one does not depend on adoption of the other. The Board of Directors could adopt either rule, both rules or neither rule.

1.1.1 Draft Rule 12-16

Draft Rule 12-16 ~~reflects a policy recommendation from CBE and their associated organizations. The rule, as proposed by CBE,~~ would limit the emissions of greenhouse gases (GHGs) ~~climate pollutants~~ and three criteria pollutants: ~~greenhouse gases (GHGs),~~ particulate matter (PM), oxides of nitrogen (NOx), and sulfur dioxide (SO_2) from petroleum refineries and three associated facilities. The draft rule would establish facility-wide emissions limits for the covered pollutants at each of the affected facilities to ensure that each facility does not increase emissions due to changes in operation, crude or product slates, or increases in production. Each facility emissions limit would be set at the maximum-annual emissions over the most recent five years reported for that facility ~~in the period from 2011 through 2015~~[1] with an additional allowance or "threshold factor" of seven percent over the maximum annual emission rate for each pollutant.

1.1.2 Draft Rule 11-18

Draft Rule 11-18~~, as proposed by Air District staff,~~ would ensure that emissions of toxic air contaminants (TACs) from existing facilities do not pose an unacceptable health risk to people living and working nearby. The rule would use the most up-to-date assumptions about the risk of compounds and would require the facility to take action to reduce its risk to a lower ~~very low~~ risk level. In the initial phase, the rule would require all facilities with a cancer risk in excess of 25 in a million (25/M) to reduce that risk below 10/M. In the second phase, all facilities not already addressed in the first phase with a health risk in excess of 10/M would be required to reduce the

[1] ~~GHG emissions are based on the 2011-2014 time period, since 2015 data is not available from the Air Resources Board yet~~ Updated and complete current emissions data are expected to be made available and included during the fall of 2016.

facility risk below 10/M. If the facility could not devise a means to reduce the risk below 10/M, the facility would be required to install best available retrofit control technology for toxic pollutants (TBARCT) on every significant source of TACs at the facility.

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 Air District is the lead agency for draft Regulation 12, Rule 16 and draft Regulation 11, Rule 18 and will prepared a draft Notice of Preparation (NOP) of an Environmental Impact Report (EIR) and Initial Study (NOP/IS) to address the potential environmental impacts associated with the draft rules.

1.3 PROJECT LOCATION

The Air District has jurisdiction over 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. Emission sources are not distributed evenly throughout the region but are concentrated in specific locations where their emissions can more strongly affect local air quality and community health. The combined source location, source strength, climatic and topographic factors result in increased potential for the accumulation of air pollutants near strong emission sources, in the inland valleys, and in other locations in the region, on various time scales ~~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).

[Editorial note: insert Figure 1-1 here.]

1.4 BACKGROUND

~~Draft Rule 12-16 would affect the five petroleum refineries currently 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).~~

~~The Draft Rule 12-16 would also affect three refinery-related facilities:~~

- ~~Air Liquide (Richmond),~~
- ~~Air Products (Martinez), and~~

- ~~Martinez Cogen LP (Martinez).~~

~~Draft Rule 11-18 would affect up to 1000 facilities that emit TACs. The Air District has determined that these emissions need to be reduced in order to be more protective of public health. These facilities include data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, etc. These facilities emit a variety of TACs that can adversely impact public health. TACs include compounds such as diesel particulate matter (DPM), benzene, polycyclic aromatic hydrocarbons (PAHs), and 1,3-butadiene.~~

~~The primary focus of CBE's concern has been petroleum refineries. 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 based on their properties, and the programs under which they are regulated. Air pollutants include: (1) criteria pollutants, (2) toxic pollutants (or TACs), and (3) climate pollutants (or GHGs). Additional categories of air contaminants include odorous compounds and visible emissions, and some harmful air pollutants do not fit neatly into these categories, such as ultra-fine particulate matter (UFPM).

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 NO_X, (3) PM in two size ranges – aerodynamic diameter of 10 micrometers or less (PM_{10}), and aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), (4) volatile organic compounds (VOC), and (5) sulfur dioxide (SO_2). Each of these criteria pollutants, as well as UFPM, is ~~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.

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 climate-forcing strength, or "global warming potential," of these three GHGs is measured by global scientific convention, and would be controlled by proposed Rule 12-16, as carbon dioxide equivalents (CO_2e).

The Air District has determined that emissions of GHGs, PM_{10}, $PM_{2.5}$, UFPM, PM precursors such as NOx and SO_2, and TACs need to be reduced in order to be more protective of public health and, in the case of GHGs, to protect the global climate as well. Oil refining is among the largest industrial sources of GHGs, criteria pollutants, and TACs in the region, however, many hundreds of sources emit, and contribute to the impacts of, these air pollutants region wide.

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 oils range widely in composition and processing characteristics, and processing oil feeds with more problematic processing characteristics or contaminants can require major capital commitments to new equipment and result in substantially increased refinery emissions, which may become "locked into place" by those large capital commitments over long periods. Oils with more problematic processing characteristics and contaminants are termed "lower quality" oils.

The Air District has found that changes in oil feed quality, among other factors, have the potential to increase refinery emissions significantly. In addition, because switching to refine oils of different quality also can increase toxic discharges as well as the frequency and magnitude of chemical spills, fires, and explosions in refineries and refinery cargo loading, it also can result in potential water quality, public health and safety hazards, and other impacts.

Draft Rule 12-16 would affect five petroleum refineries currently 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).

Draft Rule 12-16 would also affect three refinery-related facilities:

- Air Liquide (Rodeo),
- Air Products (Martinez), and
- Martinez Cogen LP (Martinez).

Draft Rule 11-18 would affect up to 1000 facilities that emit TACs. These facilities include data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, etc. These facilities emit a variety of TACs that can adversely impact public health. TACs include compounds such as diesel particulate matter (DPM), benzene, polycyclic aromatic hydrocarbons (PAHs), and 1,3-butadiene.

The regulatory approaches for draft Rules 12-16 and 11-18 are summarized below and include the following basic elements.

Regulation 12, Rule 16

- Would apply to each of ~~the~~ five Bay Area petroleum refineries and three support facilities.
- Would establish facility-wide emissions limits[2] for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2 at each of the affected facilities based on the following method:
  - Each facility emissions limit would be set at the maximum-annual emissions over the most recent five years reported for that facility ~~in the period from 2011 through 2015~~ [2] [3], and
  - Include an additional allowance or "threshold factor" that would equal seven percent over the maximum-year emissions value ~~for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2~~.
- Emissions from start-up, shut-down, maintenance and malfunction (except for emissions from flaring and cooling towers) would be subject to the cap.
- Compliance with the emissions limits would be based on comparing the annual emissions inventory with the facility-wide emissions limit for each covered pollutant. ~~Any annual emissions inventory that exceeds the established pollutant emissions limit for the affected facility would be a violation of the rule for the entire year that the inventory covers.~~ The facility would comply with the limit whenever its emissions are less than or equal to the limit. Because these limits would be designed to allow maximum current emissions accounting for business and maintenance cycles, each facility would be able to demonstrate compliance without making any change to its current equipment or operations. At the same time, these limits would ensure that significant and potentially long-lasting increases in emissions, which could be caused by changes in refinery equipment and operation, such as switching to lower quality oil feedstock, would be prevented.

Regulation 11, Rule 18

- The Air District would screen all facilities that report toxic emissions. The Air District would conduct health risk assessments (HRA) for facilities with a cancer risk prioritization score of 10 or greater or a non-cancer prioritization score of 1.0 or greater. The HRAs would incorporate the new Office of Environmental Health Hazard Assessment (OEHHA) protocol and health risk values adopted in March 2015, the Risk Management Guidelines adopted in July 2015 by the California Air Resources Board (ARB) and the California Air Pollution Control Officers Association (CAPCOA) and revised Air District HRA guidelines.
- In the first phase of the rule, facilities that pose a cancer risk in excess of 25/M or a chronic or acute hazard index in excess of 2.5 must either:
  - Reduce the facility cancer risk below 10/M and reduce the chronic and acute hazard indices below 1.0; or
  - Install TBARCT on all significant sources of toxic emissions.

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[2] Emissions from flares and cooling towers would be excluded from the calculation of these limits and the reported emissions compared with them to demonstrate compliance with these limits. Flaring is an essential emergency safety operation and its emissions are controlled by District Rule 12-12. Cooling tower leaks are not directly related to refinery energy use and are controlled by District Rule 11-10.

[3] ~~Except GHGs, which are based on 2011 through 2014 emissions due to the current unavailability of 2015 data~~ Updated and complete current emissions data are expected to be made available and included during the fall of 2016.

- In the second phase, facilities not already addressed in the first phase that pose a health risk in excess of 10/M or a chronic or acute hazard index in excess of 1.0 must either:

    - Reduce the facility cancer health risk below 10/M and reduce the chronic and acute hazard indices below 1.0; or
    - Install TBARCT on all significant sources of toxic emissions.

1.5 PROPOSED PROJECT DESCRIPTION

The descriptions of draft Regulation 11, Rule 18 and Regulation 12, Rule 16 are provided below.

1.5.1 REGULATION 12, RULE 16

1.5.1.1 Objectives

Proposed Rule 12-16 would establish enforceable numeric limits on the overall facility-wide emissions of GHGs, $PM_{2.5}$, PM_{10}, NOx and SO_2 from energy use at each major oil refinery and refinery support facility in the Bay Area. The numeric limit applied to each of these facilities and air pollutants would be set to the current actual annual mass emissions of the pollutant from the facility, accounting for variability in the current actual emissions, based on publicly verifiable data. The objectives of the Refinery Emission Caps are to:

(1) Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and SO_2 caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions.

(2) Protect the climate and public health by preventing any significant increase in these emissions from increasing the emission intensity of transportation fuels.

(3) Protect community, worker, and public health by preventing any significant increase in these emissions from worsening hazards that Health Risk Assessment methods do not measure or prevent, including but not limited to acute and chronic indoor and outdoor PM, NOx, SO_2, and ultra-fine PM exposure hazards.

(4) Protect community and worker health and safety from acute air pollution exposure incident hazards made more likely by changes in refinery oil feed quality, delivery, storage, and processing that will be discouraged or avoided by prohibiting any significant increase in facility-wide GHG, PM, NOx, or SO_2 emissions.

(5) Complement other climate, health, and safety measures, by ensuring that new commitments to long-lasting infrastructure for refining higher-emitting and more hazardous oils, which could foreclose the long-term emission reduction and safety potential of these other measures, will not be encouraged or enabled by allowing Bay Area refinery GHG, PM, NOx, or SO_2 emissions to increase.

(6) Improve the efficiency, effectiveness, transparency, and cost-effectiveness of emissions control by implementing transparent, enforceable multi-pollutant combustion emissions control without requiring any change in current actual facility equipment or operation.

~~1.5.1.1~~ 1.5.1.2 Pollutant Coverage

~~The draft Refining Cap~~ Rule 12-16 would limit the emissions of climate pollutants (GHGs) and three criteria pollutants (PM – both PM_{10} and $PM_{2.5}$, NOx, and SO_2) from refineries and other refining related facilities to a specific baseline plus an allowance~~;~~, thereby establishing a "cap" for each of these emissions that the facility could not exceed.

Greenhouse Gases (GHGs): GHGs refer to gases that contribute to global warming. In addition to negative impacts on air quality as higher temperatures contribute to increased levels of ozone and PM, climate change may cause a wide range of ecological, social, economic, and demographic impacts at both the global and the local scale. GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated hydrocarbons. CO_2 is released to the atmosphere when fossil fuels (oil, gasoline, diesel, natural gas, and coal), solid waste, and wood or wood products are burned. CH_4 is emitted during the production, combustion and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in municipal solid waste landfills and the raising of livestock. N_2O is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. Fluorinated hydrocarbons: HFCs, PFCs, and SF_6, are generated in a variety of industrial processes. Although these gases are small in terms of their absolute mass, they are potent agents of climate change as expressed by their global warming potential. Refineries emit CO_2, methane, and N_2O. Rule 12-16 would limit the combined global warming potential of these three GHGs as measured by carbon dioxide equivalents (CO_2e).

Particulate Matter (PM): Particulate matter is a complex pollutant composed of an assortment of tiny airborne particles that vary in size and mass (ultrafine (UFPM), fine ($PM_{2.5}$), respirable (PM_{10}) and coarse), and also vary in physical state (solid or liquid), chemical composition, toxicity, and how they behave in the atmosphere. These particles originate from a variety of man-made and natural sources, including fossil fuel combustion, refining crude oil, residential wood burning and cooking, wildfires, volcanoes, sea salt, and dust. Because they are so small, these particles can bypass the body's natural defenses and penetrate deep into the lungs, bloodstream, brain and other vital organs, and individual cells. Health studies have shown that exposure to PM can have a wide range of negative health effects, including triggering asthma attacks, chronic bronchitis, impaired lung development in children, heart attack, stroke, and premature death.

Refineries are the largest industrial source of PM in the Bay Area and can dominate PM emissions locally. Region-wide, residential wood burning is the largest source of PM in the Bay Area during the winter.

Nitrogen Oxides (NOx): Nitrogen oxides are a group of gases that are PM precursors (contribute to the formation of PM in the atmosphere after emission) and also form ozone when nitrogen reacts with oxygen during combustion, especially at high temperatures. These compounds (including nitric oxide and nitrogen dioxide), can contribute significantly to air pollution, especially in cities and areas with high motor vehicle traffic. In the Bay Area, nitrogen dioxide appears as a brown haze. At higher concentrations, nitrogen dioxide can damage sensitive crops, such as beans and tomatoes, and aggravate respiratory problems.

Sulfur Oxides (SOx): Heating and burning fossil fuels (such as coal and oil) release the sulfur present in these materials. In areas where large quantities of fossil fuels are used, sulfur oxides can be a major air pollution problem. The most common kind of sulfur oxide is SO_2. This substance is a PM precursor, and can react with oxygen to form sulfur trioxide, which can form sulfuric acid mist in the presence of moisture. These contaminants can damage vegetation and negatively impact the health of both humans and animals.

~~1.5.1.2~~ 1.5.1.3 Affected Facilities

~~The draft Refining Caps~~ Rule 12-16 would apply to each of ~~the Bay Area's~~ five petroleum refineries and ~~to~~ three refinery ~~additional~~ support facilities. The five refineries are the Chevron Refinery in Richmond, Shell Refinery in Martinez, Phillips 66 Refinery in Rodeo, Tesoro Refinery in Martinez, and Valero Refinery in Benicia. The three affected support facilities are Air Liquide in ~~Richmond~~ Rodeo, a hydrogen production plant, Air Products in Martinez a hydrogen production plant, and Martinez Cogen LP in Martinez, a cogeneration plant. A refinery support facility is a facility that is not directly involved in the processing of petroleum but is used in functions that are necessary to the operation of a petroleum refinery and is permitted by the Air District separately from the petroleum refinery. Refinery support facilities also are discussed in Air District reports documenting the development of Rule 12-16 (*insert web link that also is noted above*).

~~1.5.1.3~~ 1.5.1.4 The Emissions Limits

The draft emissions limit for each covered pollutant and each affected facility ~~are~~ is shown in Table 1. A numeric limit on the annual mass emission rate of each air pollutant specified is applied to each facility specified in the table. The limit is equal to the maximum-year actual emissions over the most recent five years reported for each facility ~~in 2011–2015~~ [~~3~~4] plus ~~the~~ an additional allowance, or threshold factor, of seven percent ~~that~~. This combination of maximum-year emissions over a five-year period and an additional 7 % threshold factor is intended to account for ~~normal~~ year-to-year variations in emissions resulting from short-term (eg., 3–5 year) business cycles and refinery maintenance cycles.

Table 1.
The Enforceable Emissions Limits on Refinery-Wide Emissions [a]

Facility Name & Number	Pollutants				
	GHG ~~[a] [b]~~ (thousands of metric tons)	**$PM_{2.5}$** ~~[b] [c]~~ (tons)	**PM_{10}** ~~[b] [c]~~ (tons)	**NOx** ~~[b] [c]~~ (tons)	**SO_2** ~~[b] [c]~~ (tons)
Chevron ~~[e] [d]~~: A-0010	4,770	502	526	963	394
Shell: A-0011	4,560	495	589	1,050	1,450
Phillips 66: A-0016	1,610	75.0	83.2	288	379
Tesoro: B-2758 / B-2759	2,620	77.7	97.0	1,010	626
Valero: B-2626	3,150	134	134	1,410	94.3
Martinez Cogen LP: A-1820	451	18.8	18.8	118	2.30
Air Liquide: B-7419	950	16.1	17.2	13.5	2.52
Air Products: B-0295	290	9.70	10.4	3.43	2.33

a. Annual facility-wide emission limits. ~~GHG: greenhouse gas emissions (CO_2e) as reported under Air Resources Board Mandatory Reporting. PM: filterable and condensable particulate matter.~~

b. ~~$PM_{2.5}$ ("fine" particulate matter as defined) and PM_{10} ("respirable" particulate matter as defined),; NOx: oxides of nitrogen; SO_2: sulfur dioxide as reported in the Facility's annual emission inventory.~~ GHG: greenhouse gas emissions (CO_2e) as reported under Air Resources Board Mandatory Reporting.

c. PM: filterable and condensable particulate matter, as applicable to either $PM_{2.5}$ ("fine" particulate matter ~~as defined)~~ ~~and~~ or PM_{10} ("respirable" particulate matter ~~as defined)~~,; NOx: oxides of nitrogen; SO_2: sulfur dioxide. Emissions as reported in the Facility's annual emission inventory.

~~e~~d. Facility owners or operators, as of August 2016, shown for information and context.

~~1.5.1.4~~ 1.5.1.5 Changes in Monitoring Methods

The proposed rule would incorporate a means to address potential changes in the quantities of emissions reported due solely to changes in monitoring methodologies, to ensure consistent compliance with the emissions limits while encouraging potential future improvements in emissions measurement and monitoring.

[4] Updated and complete current emissions data are expected to be made available and included during the fall of 2016. ~~Except GHGs, which are based on 2011 through 2014 emissions due to the current unavailability of 2015 data~~.

1.5.1.6 Rule 12-16 Implementation

The implementation of proposed Rule 12-16 would be relatively simple, straightforward and immediate. Current operations would be in compliance with its emission limits, as discussed in sections 1.4 and 1.5.1.4. Comparisons of the limits with actual measured and reported emissions could commence, and the limits could become effective, immediately upon adoption of the proposed Rule. Prompt implementation would maximize the rule's effectiveness in providing air quality, public health and climate protection benefits by preventing significant, potentially long-lasting, increases in harmful air pollutants. The Air District Board has stated its intention to consider adopting Rule 12-16, based on a complete and accurate analysis and proposal that can properly be considered for adoption, as expeditiously as possible and not later than May 2017.

The emissions limits in proposed Rule 12-16 would allow each facility to continue its current operations without any change. However, compliance with these limits would require full onsite mitigation for any potentially significant emission increment from changes in operations. Consequently, the emission limits in this proposed rule would discourage changes in operation that have the potential to result in a significant and unmitigated emission increase, such as those associated with new infrastructure to deliver and refine low quality oils.

Implementation of the Changes in Monitoring Methods provision of Rule 12-16 would be expected to be ongoing, can be anticipated to address new emission monitoring methods that are now planned for measurement of condensable particulate matter at one or more facilities, and could help to facilitate an unknown number of additional monitoring improvements over time.

1.5.2 REGULATION 11, RULE 18

1.5.2.1 Administrative Procedures

The draft Toxic Risk Reduction Rule would utilize the annual toxic emissions inventories reported to the Air District by sources that emit toxic compounds. From the toxic emissions inventory data, Air District[5] would conduct a site-specific Health Risk Screening Analysis (HRSA). The HRSA assesses the potential for adverse health effects from public exposure to routine and predictable emissions of TACs. Procedures used for completing HRSAs are based on guidelines adopted by CARB/CAPCOA. From these HRSAs, the Air District would categorize each facility as high (a cancer priority score (PS) of 100 or greater or a non-cancer PS of ten or greater), intermediate (a cancer PS of ten or more but less than 100 or a non-cancer PS of one or more but less than ten) or low priority (a cancer PS less than ten or a non-cancer PS less than one). In establishing the priority level for a facility, the Air District would consider:
(1) The amount of toxic pollutants emitted from the facility;
(2) The toxicity of these materials;

[5] In order to complete the analyses in a timely manner. Some of the work may be completed by independent contractors working for the Air District under direction of Air District staff.

(3) The proximity of the facility to potential receptors; and
(4) Any other factors that the Air District deems to be important.

The Air District would conduct HRAs for facilities in the high priority category. The HRAs would be conducted in accordance with the OEHHA HRA Guidelines and the CARB/CAPCOA Risk Management Guidelines that were updated in 2015. These Guidelines were updated pursuant to the Children's Environmental Health Protection Act (Senate Bill 25), which required that OEHHA develop health risk assessment procedures that ensure infants and children are protected from the harmful effects of air pollution. Using the results of the HRAs, the Air District would compile two lists of facilities:

- Facilities that pose a cancer risk in excess of 25/M or chronic or acute hazard index in excess of 2.5; and
- Facilities that pose a cancer risk between 10/M and 25/M or chronic or acute hazard index in excess of 1.0 but no greater than 2.5.

Facilities for which the HRA indicates a cancer risk value in excess of 25/M would be required to develop and submit to the Air District for review and approval a plan that would detail how the facility would either reduce the health impacts below the rule thresholds (10/M cancer risk and 1.0 HI) within three years of Air District approval of the plan, or install TBARCT on all significant sources of toxic emissions within the same three-year period.

1.5.2.2 Health Risk Assessments

The Air District 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 that people and communities may be experiencing due to specific sources or facilities or that may occur in the future due to proposed projects or proposed changes at a facility. 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. The Air District HRAs would be prepared in accordance with the most recent guidelines adopted by OEHHA in March 2015.

Air District 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 draft rule would require that the Air District conduct HRAs utilizing the most recent OEHHA HRA Guidelines along with more refined emissions inventories.

1.5.2.3 Pollutant Coverage

The draft Toxic Risk Reduction Rule would address TAC emissions from existing stationary sources. TAC emissions from new and modified sources are addressed under Air District

Regulation 2, Rule 5. The California Health and Safety Code section 39655 defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)) is a toxic air contaminant." For the purposes of this rule, TACs consists of the substances listed in Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, Table 2-5-1.

Some of the key pollutants to be addressed under the Toxic Risk Reduction Rule include the following:

Benzene: Benzene is highly carcinogenic and occurs throughout the Bay Area. Most of the benzene emitted in the Bay Area comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Stationary sources contribute 13 percent of the benzene statewide. The primary stationary sources of benzene emissions include gasoline stations, petroleum refining, electricity generation, and cement production.

1,3-Butadiene: 1,3-butadiene is another carcinogen, with similar origins to benzene, namely mainly from gasoline evaporation and motor vehicle exhaust, biomass burning, petroleum refining and electricity generation.

Polycyclic aromatic hydrocarbons (PAHs): PAHs are a set of hydrocarbons formed of multiple benzene rings. Several PAHs have been shown to be carcinogenic, the best-studied of which is Benzo(a)pyrene. Although in the Bay Area, PAHs are emitted during petroleum refining, the vast majority derive from fossil fuel and wood combustion.

Diesel Particulate Matter (DPM): DPM is the primary source of ambient risk based on risk analysis, followed by benzene and 1,3-butadiene. DPM emissions sources mainly include mobile sources, such as heavy-duty trucks, buses, construction equipment, locomotives, and ships, but also stationary sources such as stationary diesel engines and backup generators.

1.5.2.4 Source Coverage

The draft Toxic Risk Reduction Rule would apply to all sources of TAC emissions from "stationary sources" in the Bay Area. Stationary sources, as opposed to mobile sources such as trucks and other vehicles, are the sources over which the Air District has regulatory jurisdiction.

The draft Toxic Risk Reduction Rule would apply to a wide variety of sources and facilities located throughout the Bay Area, including data centers, petroleum refineries, chemical plants, waste water treatment facilities, foundries, forges, landfill operations, hospitals, crematoria, gasoline dispensing facility (GDF) i.e., gasoline stations, colleges and universities, military facilities and installations and airline operations. The Air District estimates that up to 1000 facilities could be impacted by this rule.