



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

BOARD OF DIRECTORS
SPECIAL MEETING
December 19, 2018

A meeting of the Bay Area Air Quality Management District Board of Directors will be held at 9:00 a.m. in the 1st Floor Board Room at the Air District Headquarters, 375 Beale Street, San Francisco, California 94105.

**Questions About
an Agenda Item**

The name, telephone number and e-mail of the appropriate staff person to contact for additional information or to resolve concerns is listed for each agenda item.

Meeting Procedures

The public meeting of the Air District Board of Directors begins at 9:00 a.m. The Board of Directors generally will consider items in the order listed on the agenda. However, any item may be considered in any order.

After action on any agenda item not requiring a public hearing, the Board may reconsider or amend the item at any time during the meeting.

This meeting will be webcast. To see the webcast, please visit www.baaqmd.gov/bodagendas at the time of the meeting. Closed captioning may contain errors and omissions, and are not certified for their content or form.

Public Comment Procedures

Persons wishing to make public comment must fill out a Public Comment Card indicating their name and the number of the agenda item on which they wish to speak, or that they intend to address the Board on matters not on the Agenda for the meeting.

Public Comment on Non-Agenda Matters, Pursuant to Government Code Section 54954.3 Speakers wishing to address the Board on non-agenda matters will be heard at the end of the agenda, and each will be allowed up to three minutes to address the Board at that time.

Members of the Board may engage only in very brief dialogue regarding non-agenda matters, and may refer issues raised to District staff for handling. In addition, the Chairperson may refer issues raised to appropriate Board Committees to be placed on a future agenda for discussion.

Public Comment on Agenda Items The public may comment on each item on the agenda as the item is taken up. Public Comment Cards for items on the agenda must be submitted in person to the Clerk of the Boards at the location of the meeting and prior to the Board taking up the particular item. Where an item was moved from the Consent Calendar to an Action item, no speaker who has already spoken on that item will be entitled to speak to that item again.

Speakers may speak for up to three minutes on each item on the Agenda. However, the Chairperson or other Board Member presiding at the meeting may limit the public comment for all speakers to fewer than three minutes per speaker, or make other rules to ensure that all speakers have an equal opportunity to be heard. The Chairperson or other Board Member presiding at the meeting may, with the consent of persons representing both sides of an issue, allocate a block of time (not to exceed six minutes) to each side to present their issue.

BOARD OF DIRECTORS SPECIAL MEETING AGENDA

WEDNESDAY
DECEMBER 19, 2018
9:00 A.M.

BOARD ROOM
1ST FLOOR

CALL TO ORDER

Chairperson, David Hudson

1. **Opening Comments**
Roll Call
Pledge of Allegiance

The Chair shall call the meeting to order and make opening comments. The Clerk of the Boards shall take roll of the Board members. The Chair shall lead the Pledge of Allegiance.

COMMENDATIONS/PROCLAMATIONS/AWARDS

2. *The Board of Directors will recognize outgoing Board Member Pete Sanchez for his service, leadership, and dedication to protecting air quality in the Bay Area.*

CLOSED SESSION

3. **CONFERENCE WITH LEGAL COUNSEL**

EXISTING LITIGATION (Government Code Section 54956.9(a))

Pursuant to Government Code Section 54956.9(a), a need to meet in closed session with legal counsel to consider the following cases:

- A. Western States Petroleum Association, Valero Refining Company – California, Tesoro Refining & Marketing Company, LLC, and Phillips 66 Company v. Bay Area AQMD, Contra Costa County Superior Court, Case No. N16-0963
- B. Valero Refining Company – California, Tesoro Refining & Marketing Company, LLC and Phillips 66 Company v. Bay Area AQMD, Contra Costa County Superior Court, Case No. N16-0095

OPEN SESSION

PUBLIC COMMENT ON NON-AGENDA MATTERS

4. **Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3**
For the first round of public comment on non-agenda matters at the beginning of the agenda, ten persons selected by a drawing by the Clerk of the Boards from among the Public Comment Cards indicating they wish to speak on matters not on the agenda for the meeting will have two minutes each to address the Board on matters not on the agenda. For this first round of public comments on non-agenda matters, all Public Comment Cards must be submitted in person to the Clerk of the Board at the location of the meeting and prior to commencement of the meeting.

CONSENT CALENDAR (ITEMS 5-9)

Staff/Phone (415) 749-

5. Minutes of the Board of Directors Regular Meeting of August 1, 2018 and Board of Directors Special Meeting of November 19, 2018

Clerk of the Boards/5073

The Board of Directors will consider approving the draft minutes of the Board of Directors Regular Meeting of August 1, 2018 and Board of Directors Special Meeting of November 19, 2018.

6. Board Communications Received from November 19, 2018 through December 18, 2018

J. Broadbent/5052

jbroadbent@baaqmd.gov

A copy of communications directed to the Board of Directors received by the Air District from November 19, 2018 through December 18, 2018, if any, will be at each Board Member's place.

7. Air District Personnel on Out-of-State Business Travel

J. Broadbent/5052

jbroadbent@baaqmd.gov

In accordance with Section 5.4 (b) of the Air District's Administrative Code, Fiscal Policies and Procedures Section, the Board is hereby notified that the attached memorandum lists Air District personnel who have traveled on out-of-state business in the preceding month.

8. Notices of Violations Issued and Settlements in Excess of \$10,000 during the month of November 2018

J. Broadbent/5052

jbroadbent@baaqmd.gov

In accordance with Resolution No. 2012-08, the Board of Directors will receive a list of all Notices of Violations issued, and all settlements for amounts in excess of \$10,000 during the month of November 2018.

9. Proposed Regulatory Agenda for 2019

J. Broadbent/5052

jbroadbent@baaqmd.gov

State law requires each Air District to publish a list of potential regulatory measures for the upcoming year. No regulatory measure can be brought before the Board that is not on the list, with specified exceptions. Consequently, the list contains all regulatory measures that may come before the Board of Directors in 2019.

COMMITTEE REPORTS

10. Report of the **Mobile Source Committee** Meeting of December 17, 2018

CHAIR: S. Haggerty

J. Broadbent/5052
jbroadbent@baaqmd.gov

The Committee will receive the following reports:

A) Projects and Contracts with Proposed Grant Awards Over \$100,000

- 1) *Approve recommended projects with proposed grant award over \$100,000 as shown in Attachment 1; and*
- 2) *Authorize the Executive Officer/APCO to enter into all necessary agreements with applicants for the recommended projects.*

B) Fiscal Year Ending (FYE) 2017 Transportation Fund for Clean Air (TFCA) Program Audit Results

- 1) *None; receive and file.*

C) Report on Transportation Fund for Clean Air (TFCA) Projects Expenditures and Effectiveness for Fiscal Year Ending (FYE) 2018

- 1) *None; receive and file.*

11. Report of the **Legislative Committee** Meeting of December 17, 2018

CHAIR: D. Kim

J. Broadbent/5052
jbroadbent@baaqmd.gov

The Committee will receive the following reports:

A) Review of the 2018 Legislative Year

- 1) *None; receive and file.*

B) Discussion of Potential 2019 Legislative Agenda

- 1) *Consider recommending a 2019 Legislative Agenda.*

PUBLIC HEARINGS

12. **Public Hearing to Consider Adoption of Proposed Assembly Bill (AB) 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule, and the Certification of a Final Environmental Impact Report (EIR) Pursuant to the California Environmental Quality Act (CEQA)**

J. Broadbent/5052

jbroadbent@baaqmd.gov

The Board of Directors will consider adoption of proposed AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule, and the certification of a Final Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA). The Expedited BARCT Implementation Schedule includes potential rule development projects for reducing criteria pollutant emissions at industrial Cap-and-Trade facilities.

13. **Public Hearing to Consider Adoption of Proposed Amendments to Regulations 6, Rule 5: Particulate Matter from Refinery Fluidized Catalytic Cracking Units; Proposed Amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; Proposed Amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking; and Certification of the Final Environmental Impact Report Pursuant to the California Environmental Quality Act (CEQA)**

J. Broadbent/5052

jbradbent@baaqmd.gov

The Board of Directors will consider adopting a suite of amendments affecting petroleum refinery operations: proposed amendments to Regulation 6, Rule 5: Particulate Matter from Refinery Fluid Catalytic Cracking Units; proposed amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; proposed amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking; and Certification of a Final Environmental Impact Report pursuant to the California Environmental Quality Act (CEQA). Attached is a public hearing notice, a copy of the proposed amendments in regulatory format, staff report and supporting documentation, and CEQA Draft Environmental Impact Report.

PUBLIC COMMENT ON NON-AGENDA MATTERS

14. **Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3**

Speakers who did not have the opportunity to address the Board in the first round of comments on non-agenda matters will be allowed two minutes each to address the Board on non-agenda matters.

BOARD MEMBERS' COMMENTS

15. *Any member of the Board, or its staff, on his or her own initiative or in response to questions posed by the public, may: ask a question for clarification, make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter or take action to direct staff to place a matter of business on a future agenda. (Gov't Code § 54954.2)*

OTHER BUSINESS

16. Report of the Executive Officer/APCO

17. Chairperson's Report

18. Time and Place of Next Meeting:

Wednesday, January 16, 2019, at Embassy Suites by Hilton San Rafael Marin County, 101 McInnis Parkway, San Rafael, CA 94903 at 9:30 a.m.

19. Adjournment

The Board meeting shall be adjourned by the Board Chair.

CONTACT:

MANAGER, EXECUTIVE OPERATIONS
375 BEALE STREET, SAN FRANCISCO, CA 94105
vjohnson@baaqmd.gov

(415) 749-4941
FAX: (415) 928-8560
BAAQMD homepage:
www.baaqmd.gov

- To submit written comments on an agenda item in advance of the meeting. Please note that all correspondence must be addressed to the “Members of the Board of Directors” and received at least 24 hours prior, excluding weekends and holidays, in order to be presented at that Board meeting. Any correspondence received after that time will be presented to the Board at the following meeting.
- To request, in advance of the meeting, to be placed on the list to testify on an agenda item.
- Any writing relating to an open session item on this Agenda that is distributed to all, or a majority of all, members of the body to which this Agenda relates shall be made available at the District’s offices at 375 Beale Street, Suite 600, San Francisco, CA 94105, at the time such writing is made available to all, or a majority of all, members of that body.

Accessibility and Non-Discrimination Policy

The Bay Area Air Quality Management District (Air District) does not discriminate on the basis of race, national origin, ethnic group identification, ancestry, religion, age, sex, sexual orientation, gender identity, gender expression, color, genetic information, medical condition, or mental or physical disability, or any other attribute or belief protected by law.

It is the Air District’s policy to provide fair and equal access to the benefits of a program or activity administered by Air District. The Air District will not tolerate discrimination against any person(s) seeking to participate in, or receive the benefits of, any program or activity offered or conducted by the Air District. Members of the public who believe they or others were unlawfully denied full and equal access to an Air District program or activity may file a discrimination complaint under this policy. This non-discrimination policy also applies to other people or entities affiliated with Air District, including contractors or grantees that the Air District utilizes to provide benefits and services to members of the public.

Auxiliary aids and services including, for example, qualified interpreters and/or listening devices, to individuals who are deaf or hard of hearing, and to other individuals as necessary to ensure effective communication or an equal opportunity to participate fully in the benefits, activities, programs and services will be provided by the Air District in a timely manner and in such a way as to protect the privacy and independence of the individual. Please contact the Non-Discrimination Coordinator identified below at least three days in advance of a meeting so that arrangements can be made accordingly.

If you believe discrimination has occurred with respect to an Air District program or activity, you may contact the Non-Discrimination Coordinator identified below or visit our website at www.baaqmd.gov/accessibility to learn how and where to file a complaint of discrimination.

Questions regarding this Policy should be directed to the Air District’s Non-Discrimination Coordinator, Rex Sanders, at (415) 749-4951 or by email at rsanders@baaqmd.gov.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
375 BEALE STREET, SAN FRANCISCO, CALIFORNIA 94105
FOR QUESTIONS PLEASE CALL (415) 749-4941**

**EXECUTIVE OFFICE:
MONTHLY CALENDAR OF AIR DISTRICT MEETINGS**

DECEMBER 2018

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month)</i>	Monday	17	9:30 a.m.	1 st Floor Board Room
Board of Directors Legislative Committee <i>(At the Call of the Chair)</i>	Monday	17	10:30 a.m.	1 st Floor Board Room
Board of Directors Special Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	19	9:00 a.m.	1 st Floor Board Room
Board of Directors Budget & Finance Committee <i>(Meets on the 4th Wednesday of each Month)</i> - CANCELLED	Wednesday	26	9:30 a.m.	1 st Floor, Yerba Buena Room #109
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month)</i> - CANCELLED AND RESCHEDULED TO MONDAY, DECEMBER 17, 2018 AT 9:30 A.M.	Thursday	27	9:30 a.m.	1 st Floor Board Room

JANUARY 2019

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
Board of Directors Regular Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i> - CANCELLED	Wednesday	2	9:30 a.m.	1 st Floor Board Room
Board of Directors Special Meeting/Retreat <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	16	9:30 a.m.	Embassy Suites Novato Meeting Room 101 McInnis Parkway San Rafael, CA 94903
Board of Directors Climate Protection Committee <i>(Meets on the 3rd Thursday of every other Month)</i>	Thursday	17	9:30 a.m.	1 st Floor Board Room
Board of Directors Stationary Source Committee <i>(Meets on the 3rd Monday of every other Month)</i>	Monday	21	9:30 a.m.	1 st Floor Board Room
Board of Directors Budget & Finance Committee <i>(Meets on the 4th Wednesday of each Month)</i>	Wednesday	23	9:30 a.m.	1 st Floor, Yerba Buena Room #109
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month)</i>	Thursday	24	9:30 a.m.	1 st Floor Board Room

FEBRUARY 2019

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
Board of Directors Regular Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	6	9:30 a.m.	1 st Floor Board Room
Board of Directors Regular Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	20	9:30 a.m.	1 st Floor Board Room
Board of Directors Budget & Finance Committee <i>(Meets on the 4th Wednesday of each Month)</i>	Wednesday	27	9:30 a.m.	1 st Floor, Yerba Buena Room #109
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month)</i>	Thursday	28	9:30 a.m.	1 st Floor Board Room
HL – 12/6/18 – 2:20 p.m.				G/Board/Executive Office/Moncal

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: November 27, 2018

Re: Minutes of the Board of Directors Regular Meeting of August 1, 2018 and Board of
Directors Special Meeting of November 19, 2018

RECOMMENDED ACTION

Approve the attached revised draft minutes of the Board of Directors Regular Meeting of August 1, 2018, and the draft minutes of the Board of Directors Special Meeting of November 19, 2018.

DISCUSSION

Attached for your review and approval are the revised draft minutes of the Board of Directors Regular Meeting of August 1, 2018, and the draft minutes of the Board of Directors Special Meeting of November 19, 2018.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Marcy Hiratzka
Reviewed by: Vanessa Johnson

Attachment 5A: Revised Draft Minutes of the Board of Directors Regular Meeting of August 1, 2018
Attachment 5B: Draft Minutes of the Board of Directors Special Meeting of November 19, 2018

AGENDA 5A – ATTACHMENT

Draft Minutes - Board of Directors Regular Meeting of August 1, 2018

Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105
(415) 749-5073

Board of Directors Regular Meeting
Wednesday, August 1, 2018

DRAFT MINUTES (REVISED 12/19/18)

Note: Audio recordings of the meeting are available on the website of the Bay Area Air Quality Management District at www.baaqmd.gov/bodagendas

CALL TO ORDER

1. **Opening Comments:** Board of Directors (Board) Chairperson, David Hudson, called the meeting to order at 9:32 a.m.

Roll Call:

Present: Chairperson David Hudson; Vice Chair Katie Rice; Secretary Rod Sinks; and Directors Teresa Barrett, John J. Bauters, David Canepa, Carole Groom, Scott Haggerty, Tyrone Jue, Doug Kim, Nate Miley, Karen Mitchoff, Mark Ross, Brad Wagenknecht, and Shirlee Zane.

Absent: Directors Margaret Abe-Koga, Cindy Chavez, Pauline Russo Cutter, John Gioia, Liz Kniss, Hillary Ronen, Pete Sanchez, and Jim Spering.

PUBLIC COMMENT ON NON-AGENDA MATTERS

2. **Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3**

No requests received.

CONSENT CALENDAR (ITEMS 3 – 6)

3. Minutes of the Regular Board of Directors Meeting of June 6, 2018
4. Board Communications Received from June 6, 2018 through July 31, 2018
5. Air District (District) Personnel on Out-of-State Business Travel
6. Notices of Violations Issued and Settlements in Excess of \$10,000 during the month of May and June 2018

Public Comments:

No requests received.

Board Comments:

None.

Board Action:

Director Mitchoff made a motion, seconded by Director Wagenknecht, to **approve** the Consent Calendar Items 3 through 6 inclusive; and the motion **carried** by the following vote of the Board:

AYES: Barrett, Bauters, Canepa, Groom, Haggerty, Hudson, Jue, Kim, Mitchoff, Rice, Ross, Sinks, and Wagenknecht.
NOES: None.
ABSTAIN: None.
ABSENT: Abe-Koga, Chavez, Cutter, Gioia, Kniss, Miley, Ronen, Sanchez, Spering, and Zane.

COMMITTEE REPORTS

7. Report of the Technology Implementation Office Steering Committee Meeting of June 21, 2018

Chair Hudson read the following Committee report:

The Committee met on Thursday, June 21, 2018, and approved the minutes of March 2, 2018.

The Committee reviewed and discussed the staff presentation, Clean Cars for All: New Incentives Program for Low-Income Consumers.

The Committee then reviewed and discussed the staff presentation Mission and Customer Discovery.

The Committee then reviewed and discussed the staff presentation Proposed Loan Relationship.

Finally, the Committee reviewed and discussed the staff presentation Update on Technology Assessment Results.

The next meeting of the Technology Implementation Office Steering Committee will be held on Monday, October 22, 2018, at 9:30 a.m., at the Bay Area Air Quality Management District Office, 375 Beale Street, San Francisco, California 94105. This concludes the Chair Report of the Technology Implementation Office Steering Committee.

Public Comments:

No requests received.

Board Comments:

None.

Board Action:

None; receive and file.

8. **Report of the Personnel Committee Meeting of July 12, 2018**

Personnel Committee Vice Chair, Director Doug Kim, read the following Committee report:

The Committee met on Thursday, July 12, 2018, and approved the minutes of May 7, 2018.

The Committee then reviewed and discussed the reappointment of Valerie J. Armento, the Principal Member Incumbent in the Attorney Category of the Air District's Hearing Board. Ms. Armento is currently the Chair of the Hearing Board and her current three-year term will expire on July 28, 2018. The Committee recommends the Board approve:

- 1. The reappointment of Valerie J. Armento as Attorney Category Principal Member of the Hearing Board.*

Finally, the Committee reviewed and discussed two candidates for the vacant Alternate seat on the Air District's Hearing Board in the Professional Engineering category. The Committee and staff discussed the recruitment process and then interviewed the single candidate that was in attendance. The Committee recommends the Board approve:

- 1. The appointment of Catherine Fortney as Professional Engineer Category Alternate Member of the Hearing Board.*

The next meeting of the Personnel Committee will be held at the call of the Chair. I move that the Board approve the Personnel Committee recommendations. This concludes the Chair Report of the Personnel Committee.

Public Comments:

No requests received.

Board Comments:

None.

Board Action:

Director Kim made a motion, seconded by Director Wagenknecht, to **approve** the recommendations of the Personnel Committee; and the motion **carried** by the following vote of the Board:

AYES: Barrett, Bauters, Canepa, Groom, Haggerty, Hudson, Jue, Kim, Mitchoff, Rice, Ross, Sinks, and Wagenknecht.
NOES: None.
ABSTAIN: None.

ABSENT: Abe-Koga, Chavez, Cutter, Gioia, Kniss, Miley, Ronen, Sanchez, Spering, and Zane.

9. **Report of the Advisory Council Meeting of July 19, 2018**

Advisory Council Ex Officio member, Board Secretary Rod Sinks, read the following Committee report:

The Council met on Thursday, July 19, 2018 and approved the minutes of October 30, 2017, and March 26, 2018.

The Council then received the staff presentation Introduction of New Members to the Air District's Advisory Council, during which, Drs. Linda Rudolph and Gina Solomon, were introduced as new Council members.

Next, the Council received the staff presentation Update on Assembly Bill (AB) 617.

The Council then received the staff presentation Health Impacts and Assessments of Diesel Particulate Matter (DPM) in the Bay Area.

Next, the Council received the staff presentation Update on the Air District's DPM Reduction Strategy. The Council authorized Chair Hayes to draft language for a statement to be presented to the Board of Directors, reflecting the Council's position on the reduction of diesel emissions.

Due to the shortage of time, the Council chose to table staff presentation Ongoing Discussion of DPM: How Low is "Low Enough"?

The next meeting of the Council will be at the call of the Chair. This concludes the Chair Report of the Advisory Council.

At this time, Advisory Council Chair Hayes presented an update on the Advisory Council's deliberations regarding DPM.

NOTED PRESENT: Director Zane was noted present at 9:39 a.m.

Public Comments:

No requests received.

Board Comments:

The Board and staff discussed how the Advisory Council's presentation has been, and may continue to be, an effective supplemental tool to the District's "Diesel-Free by '33" pledge.

Board Action:

None; receive and file.

10. Report of the Executive Committee Meeting of June 23, 2018

Chair Hudson read the following Committee report:

The Executive Committee met on Monday, July 23, 2018, and approved the minutes of April 16, 2018.

The Committee received the presentation Hearing Board Quarterly Report: April to June 2018.

The Committee then reviewed and discussed the staff presentation Recommended AB 617 Communities for Community Plans. The Committee recommends the Board:

- 1) Approve staff recommendations for Community Air Monitoring and Community Emission Reduction Plans under the State's Community Air Protection Plan, as amended.*

The Committee then reviewed and discussed the staff presentation Update of Governor's Global Climate Action Summit.

The Committee then reviewed and discussed the staff presentation Technology Implementation Office Update and Summary of Steering Committee Meeting. The Committee requested that staff make a brief presentation to the Board on the details of this program at the end of this report. The Committee recommends the Board:

- 1) Authorize the Executive Officer/Air Pollution Control Officer (APCO) to negotiate and execute an agreement with the California Infrastructure Economic Development Bank (IBank) not to exceed \$4,185,000 to fund a loan program for Bay Area industrial facilities.*

The Committee then reviewed and discussed the staff presentation Status Update on the Air District's Advisory Council.

The Committee then reviewed and discussed the staff presentation Amendments to Air District Administrative Code Addressing Resolutions. The Committee recommends the Board:

- 1) Approve language amending Section 1.6 of the Air District's Administrative Code to address introduction and amendment of resolutions, to be noticed in an upcoming Board of Directors meeting agenda and placed on the agenda for adoption at a subsequent meeting.*

Finally, the Committee reviewed and discussed the staff presentation Discussion of Procedures for Receiving Public Comment on Non-Agenda Topics. The Committee provided direction to staff on procedures to be used for Board of Directors and Board Committee agendas.

The next meeting of the Executive Committee will be at the call of the Chair.

At this time, Lisa Fasano, Communication Officer, announced that Steve Kerr, Head Coach of the Golden State Warriors, has confirmed his attendance as the keynote speaker at the Global Climate Action Summit affiliate event, hosted by the Air District on September 12, 2018.

Then, Ranyee Chiang, Technology Implementation Officer, and Teveia Barnes, IBank Executive Director, explained how the District is negotiating a Memorandum of Agreement to enhance two IBank

programs: the California Lending for Energy and Environmental Needs Center for direct public financing to Municipalities, Universities, Schools, and Hospitals; and the California Small Business Loan Guarantee Program for loan guarantees for small businesses. The staff presentation, *Stationary Incentive Program: Connecting Technologies and Customers*, included: key financing terms of proposed Revolving Loan Program; and Proposed Financing Process.

I move that the Board approve the Executive Committee's recommendations. This concludes the Chair report of the Executive Committee.

Public Comments:

Public comments were given by Janet Stormberg, 350 Bay Area.

Board Comments:

The Board and staff discussed the desire to not abbreviate acronyms in writing or verbally; the types of programs that would be eligible for District/IBank funding; and whether a District/IBank loan awardee would also be eligible to apply for other District incentives and grants.

Board Action:

Chair Hudson made a motion, seconded by Vice Chair Rice, to **approve** the recommendations of the Executive Committee; and the motion **carried** by the following vote of the Board:

AYES: Barrett, Bauters, Canepa, Groom, Haggerty, Hudson, Jue, Kim, Mitchoff, Rice, Ross, Sinks, Wagenknecht, and Zane.
NOES: None.
ABSTAIN: None.
ABSENT: Abe-Koga, Chavez, Cutter, Gioia, Kniss, Miley, Ronen, Sanchez, and Spring.

11. Report of the Ad Hoc Refinery Oversight Committee Meeting of July 25, 2018

Chair Hudson read the following Committee report:

The Committee met on Wednesday, July 25, 2018, and approved the minutes of April 9, 2018.

The Committee reviewed and discussed the presentation Trends in Crude Oil Imports, Petroleum Refining, Crude Oil Transportation, and an Outlook for Future Petroleum Markets.

The Committee then reviewed and discussed the staff presentation Issues and Concerns Regarding Future Refinery Crude Slates.

Finally, the Committee reviewed and discussed the staff presentation The Legal Framework for the Air District.

The next meeting of the Ad Hoc Refinery Oversight Committee will be at the call of the Chair. This concludes the Chair Report of the Ad Hoc Refinery Oversight Committee.

Public Comments:

No requests received.

Board Comments:

None.

Board Action:

None; receive and file.

12. Report of the Mobile Source Committee Meeting of July 26, 2018

Mobile Source Committee Chair, Director Scott Haggerty, read the following Committee report:

The Committee met on Thursday, July 26, 2018, and approved the minutes of May 24, 2018.

The Committee reviewed and discussed the staff presentation, Projects and Contracts with Proposed Grant Awards Over \$100,000, and a Request for a Waiver for Fiscal Year Ending 2018 Transportation Fund for Clean Air Regional Fund Policies from the Town of Los Gatos. The Committee recommends the Board:

- 1. Approve Carl Moyer Program and Transportation Fund for Clean Air projects with proposed grant awards over \$100,000 as shown in Attachment 1;*
- 2. Approve a policy waiver to allow the Town of Los Gatos to be eligible for funding from the Fiscal Year Ending 2018 Transportation Fund for Clean Air Regional Fund for a bikeway improvement project that will upgrade an existing Class II bicycle lane to a separated Class Four bikeway; and*
- 3. Authorize the Executive Officer/Air Pollution Control Officer to enter into all necessary agreements with applicants for the recommended projects.*

The Committee then reviewed and discussed the staff presentation Approval of Contract for Clean Cars for All Program Case Managers. The Committee recommends the Board:

- 1. Authorize the Executive Officer/Air Pollution Control Officer to execute a contract with GRID Alternatives at a cost not to exceed \$250,000 for services performed in Fiscal Year Ending 2018 and Fiscal Year Ending 2019.*

Finally, the Committee reviewed and discussed the staff presentation New Grant Program Revenues and Request to Increase Staffing in the Strategic Incentives Division. The Committee recommends the Board:

- 1. Authorize the Bay Area Air Quality Management District to accept, obligate, and expend up to \$130 million in funding from the Volkswagen (VW) Environmental Mitigation Trust and \$1,160,311 in funding from the United States Environmental Protection Agency; and amend the Fiscal Year Ending 2019 budget to account for this new funding;*

2. *Authorize the Executive Officer/Air Pollution Control Officer to enter into all agreements necessary to accept, obligate, and expend this funding; and*
3. *Authorize the creation of eight additional full-time equivalent positions in the Strategic Incentives and Compliance and Enforcement Divisions and Finance Section.*
The Committee also recommended that staff return to the Personnel Committee to discuss its overall staffing strategy considering this increase.

At this time, Jack Broadbent, Executive Officer/Air Pollution Control Officer gave the staff presentation *New Grant Program Revenues and Request to Increase Staffing in the Strategic Incentives Division*, including: staffing evaluation process.

The next meeting of the Mobile Source Committee will be held on Thursday, September 27, 2018, at 9:30 a.m., at the Bay Area Air Quality Management District office, 375 Beale Street, San Francisco, CA 94105. I move that the Board approve the Mobile Source Committee's recommendations. This concludes the Chair Report of the Mobile Source Committee.

Public Comments:

No requests received.

Board Comments:

The Board and staff discussed how the funding from the VW Trust will be targeted and delivered to the three air districts that will be co-managing those funds over the next ten years; the forecast of additional staffing needs in the Strategic Incentives Division; the forecast of expenditures of the funds from the VW Trust, and the suggestion for an audit to prolong the longevity of those funds; the difference between the \$2 billion dollar Dieselgate VW settlement promoting electric vehicles in the US (Electrify America) and the VW trust funds being allocated to the air districts through the California Air Resources Board (CARB); and the percentage of administrative funding versus project funding from the VW Trust.

Board Action:

Director Haggerty made a motion, seconded by Director Bauters, to **approve** the recommendations of the Mobile Source Committee; and the motion **carried** by the following vote of the Board:

AYES: Barrett, Bauters, Canepa, Groom, Haggerty, Hudson, Jue, Kim, Mitchoff, Rice, Ross, Sinks, Wagenknecht, and Zane.
NOES: None.
ABSTAIN: None.
ABSENT: Abe-Koga, Chavez, Cutter, Gioia, Kniss, Miley, Ronen, Sanchez, and Spring.

13. Report of the Stationary Source Committee Meeting of July 30, 2018

Chair Hudson read the following Committee report:

The Committee met on Monday, July 30, 2018, and approved the minutes of May 21, 2018.

The Committee reviewed and discussed the presentation Air Pollution Complaint Process Overview.

The Committee then reviewed and discussed the staff presentation Amending Regulation 7: Odorous Substances.

Finally, the Committee reviewed and discussed the staff presentation Improving Neighborhood Air Quality.

The next meeting of the Stationary Source Committee will be held on Monday, September 17, 2018, at 9:30 a.m., at the Bay Area Air Quality Management District office, 375 Beale Street, San Francisco, CA 94105. This concludes the Chair Report of the Stationary Source Committee.

Public Comments:

No requests received.

Board Comments:

None.

Board Action:

None; receive and file.

14. Report of the Ad Hoc Building Oversight Committee Meeting of August 1, 2018

Ad Hoc Building Oversight Committee Chair, Director Mark Ross, read the following Committee report:

The Ad Hoc Building Oversight Committee met on Wednesday, August 1, 2018, and approved the minutes of June 6, 2018.

The Committee met in Closed Session to receive an update on the Richmond Property, but there is no reportable action.

The next meeting of the Ad Hoc Building Oversight Committee will be held on Wednesday, September 5, 2018, at 9 a.m., at the Bay Area Air Quality Management District office, 375 Beale Street, San Francisco, CA 94105. This concludes the Chair report of the Ad Hoc Building Oversight Committee.

Public Comments:

No requests received.

Board Comments:

None.

Board Action:

None; receive and file.

PUBLIC HEARINGS

15. Recommended Assembly Bill 617 Communities for Community Plans

Mr. Broadbent introduced Elizabeth Yura, Community Health Protection Officer, who gave the staff presentation *Improving Neighborhood Air Quality*, including: AB 617 overview; spring workshops; community recommendations; West Oakland; Richmond; other large source communities; woodsmoke communities; landfill/organics communities; what's next; and recommended action.

NOTED PRESENT: Director Miley was noted present at 10:31 a.m.

Chair Hudson opened the Public Hearing to Consider Staff Recommendations for Community Air Monitoring and Community Emission Reduction Plans Under the State's Community Air Protection Program.

Public Comments:

Public comments were given by Janet Stromberg, 350 Bay Area; Rodeo resident, Janet Pygeorge; and Bob Brown, Western States Petroleum Association.

Board Comments:

The Board and staff discussed the Board's appreciation of staff for procuring funds for the first year of the AB 617 program, and acknowledged that annual petitions will have to be made to the State for ongoing funding for AB 617 implementation and maintenance; the District's methodology for selecting communities for Years 2-5 of the AB 617 and how input from CARB and the environmental justice community also contributes to community selection; projected benefits in the next five years of the AB 617 program for both selected and non-selected communities; the Board's appreciation of the District's focus on public health and procurement of a Health Officer, and the request for a report on the tasks completed by the Health Officer; the request that the District publicly emphasizes the correlation between pollution and health impacts in disadvantaged communities and collects data from each Bay Area county Public Health Department and hospitals; how "low life expectancy" is defined, how elderly communities can affect life expectancy rates, and the request that a more detailed life expectancy map be provided to the Board in the future; the observation that some residential wood burning may result not from necessity, but preference, despite District regulations; the request that community capacity building needs come back to the Board for discussion; the request that the District studies the correlations between PM and cognitive diseases in women; and the need to include Board members in community-led events related to AB 617.

Chair Hudson closed the Public Hearing.

Board Action:

Director Groom made a motion, seconded by Director Canepa, to **approve** staff recommendations for community air monitoring and community emission reduction plans under the state's Community Air Protection Program; and the motion **carried** by the following vote of the Board:

AYES: Barrett, Bauters, Canepa, Groom, Haggerty, Hudson, Jue, Kim, Miley, Mitchoff, Rice, Ross, Sinks, Wagenknecht, and Zane.
NOES: None.
ABSTAIN: None.
ABSENT: Abe-Koga, Chavez, Cutter, Gioia, Kniss, Ronen, Sanchez, and Spring.

16. **Public Hearing to Consider Adoption of Proposed Regulation 6, Particulate Matter (PM) - Common Definitions and Test Methods; Proposed Amendments to Regulation 6, PM Rule 1: General Requirements; Proposed Regulation 6, PM, Rule 6: Prohibition of Trackout; and Approval of a California Environmental Quality Act (CEQA), Negative Declaration**

Mr. Broadbent introduced Guy Gimlen, Principal Air Quality Engineer, who gave the staff presentation *Particulate Matter Rules – Public Hearing*, including: outline; PM basics; PM health impacts; PM health burden in the Bay Area; PM control measures in 2010 Clean Air Plan; air quality trends; high PM_{2.5} locations; sources of PM₁₀ and PM_{2.5}; targeted sources; control methods; structure for PM rules; Rule 6-1: General Requirements; bulk material handling; examples of bulk material dust and controls; prohibition of trackout; examples of road dust and trackout controls; rulemaking process; CEQA analysis; socioeconomics analysis; response to comments; and recommendation.

Chair Hudson opened the Public Hearing to Consider Adoption of Proposed Regulation 6, PM - Common Definitions and Test Methods; Proposed Amendments to Regulation 6, PM, Rule 1: General Requirements; Proposed Regulation 6, PM, Rule 6: Prohibition of Trackout; and Approval of a CEQA, Negative Declaration

Public Comments:

Public comments were given by Jed Holtzman, Richard Gray, and Janet Stromberg, 350 Bay Area.

Board Comments:

The Board and staff discussed the efficiency of monitoring trackout prevention; concerns from landfill facilities that solid waste operations would be severely impacted by the proposed changes to Regulation 6; the concern that the District-recommended incremental water use for certain control measures that are designed to prevent facilities from exceeding draft opacity limits is excessive and may affect residential water usage, and whether local water agencies have been/will be contacted by the District; whether agricultural operations are exempt from District Regulation 6; the request that the District further monitors and refines trackout prevention practices; whether additional staffing needs are anticipated regarding proposed amendments to District Regulation 6; staff's suggestion to report back to the Stationary Source Committee on water usage concerns that were raised; and the request that staff reports back to the Board after communicating with local water agencies about potential increases in water usage to reduce construction dust.

Chair Hudson closed the Public Hearing.

Board Action:

Director Wagenknecht made a motion, seconded by Director Haggerty, to **adopt** Proposed Regulation 6, PM - Common Definitions and Test Methods; Proposed Amendments to Regulation 6, PM, Rule 1: General Requirements; Proposed Regulation 6, PM, Rule 6: Prohibition of Trackout; and Approval of a CEQA, Negative Declaration; and the motion **carried** by the following vote of the Board:

AYES: Barrett, Bauters, Canepa, Groom, Haggerty, Hudson, Jue, Kim, Miley, Mitchoff, Rice, Ross, Sinks, Wagenknecht, and Zane.
NOES: None.
ABSTAIN: None.
ABSENT: Abe-Koga, Chavez, Cutter, Gioia, Kniss, Ronen, Sanchez and Sperring.

PUBLIC COMMENT ON NON-AGENDA MATTERS (OUT OF ORDER, ITEM 18)

17. **Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3**

Public comments were given by Jed Holtzman and Richard Gray, 350 Bay Area.

CLOSED SESSION (12:12 pm)

18. **CONFERENCE WITH REAL PROPERTY NEGOTIATOR – (*Government Code Section 54956.8*) (ITEM 17)**

Reportable Action: ~~Chair Hudson announced that no reportable action was taken during Closed Session.~~

REVISED Reportable Action: Chair Hudson reported that the Board of Directors gave the real property negotiator direction to purchase property at 4102, 4104, 4108, 4114, 4124 Lakeside Drive, Richmond, CA 94806, with price and terms to be reported when finally negotiated.

OPEN SESSION (12:24 pm)

BOARD MEMBER COMMENTS

19. The following comments were made by Board members:

- Director Groom thanked staff for arranging a tour of the Chevron refinery in Richmond on July 31, 2018.
- Secretary Sinks commended staff for their presentations given to the Ad Hoc Refinery Oversight Committee on July 25, 2018 and encouraged the rest of the Board members to view the webcast.
- Director Mitchoff announced that the Contra Costa County Board of Supervisors is going to consider the District’s “Diesel Free by 33” pledge for adoption on August 7, 2018.
- Director Kim expressed his disappointment that his 2017 request for a wildfire plan has not yet been drafted for the Board. He requested that one be created and presented to the Board as soon as possible.

OTHER BUSINESS

20. Report of the Executive Officer/Air Pollution Control Officer

Mr. Broadbent announced the following:

- There will be a Board meeting on September 5, 2018, at which, health and climate impacts from diesel particulate matter will be discussed in preparation for the Global Climate Action Summit on September 12-14.
- The District's Global Climate Action Summit affiliate event, "United Against GHGs - Diesel Free by '33," will be held on September 12, 2018 at the Bay Area Metro Center. This is an invitation-only event.
- Wildfire season is to be addressed at the first Board meeting in October. A slide showing a smoke winds forecast was displayed. Director Zane requested daily air quality reports for Sonoma County, especially in Santa Rosa. Vice Chair Rice asked for best practices and recommended behavior changes during fire season that County Public Health Officers can distribute.

21. Chairperson's Report

Chair Hudson announced the following:

- The following meetings have been cancelled:
 - August 15 Board of Directors
 - August 22 Budget and Finance Committee
 - August 23 Mobile Source Committee
- Several Board members will be attending a tour of the Athabasca tar sands from August 12-14 in Fort McMurray, Alberta, Canada.
- Chair Hudson gave his and Director Ross' report out on the 111th Annual Air and Waste Management Conference, which took place in Hartford, Connecticut from June 25-28.

22. Time and Place of Next Meeting

Wednesday, September 5, 2018, at 375 Beale Street, San Francisco, CA 94105 at 9:30 am.

23. Adjournment

The meeting adjourned at 12:34 a.m.

Marcy Hiratzka
Clerk of the Boards

AGENDA 5B – ATTACHMENT

Draft Minutes - Board of Directors Special Meeting of November 19, 2018

Bay Area Air Quality Management District
375 Beale Street, Suite 600, San Francisco, CA 94105
(415) 749-5073

Board of Directors Special Meeting
Wednesday, November 19, 2018

DRAFT MINUTES

Note: Audio recordings of the meeting are available on the website of the Bay Area Air Quality Management District at www.baaqmd.gov/bodagendas

CALL TO ORDER

1. **Opening Comments:** Board of Directors (Board) Chairperson, David Hudson, called the meeting to order at 10:25 a.m.

Roll Call:

Present: Chairperson David Hudson; Vice Chair Katie Rice; Secretary Rod Sinks; and Directors Margaret Abe-Koga, Teresa Barrett, David Canepa, Cindy Chavez, John Gioia, Carole Groom, Tyrone Jue, Rafael Mandelman, Karen Mitchoff, Mark Ross, Jim Spering, Brad Wagenknecht, and Shirlee Zane.

Absent: Directors John J. Bauters, Pauline Russo Cutter, Scott Haggerty, Doug Kim, Liz Kniss, Nate Miley, Hillary Ronen, and Pete Sanchez.

PUBLIC COMMENT ON NON-AGENDA MATTERS

2. **Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3**

No requests received.

CONSENT CALENDAR (ITEMS 3 - 11)

3. Minutes of the Regular Board of Directors Meeting of November 7, 2018
4. Board Communications Received from November 7, 2018 through November 18, 2018
5. Quarterly Report of California Air Resources Board Representative – Honorable John Gioia
6. Quarterly Report of the Executive Office and Division Activities for the Months of July 2018 – September 2018
7. Air District Personnel on Out-of-State Business Travel
8. Authorization to Execute a Contract for Agricultural Waste Chipping in Lieu of Open Burning
9. Notices of Violations Issued and Settlements in Excess of \$10,000 in the Month of October 2018

10. Set a Public Hearing for December 19, 2018 to Consider Adoption of Proposed Assembly Bill (AB) 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule, and the Certification of a Final Environmental Impact Report (EIR) Pursuant to the California Environmental Quality Act (CEQA)
11. Set a Public Hearing for December 19, 2018 to Consider Adoption of Amendments to Three Regulations Impacting Refineries: Amendments to Regulation 6, Rule 5: Particulate Matter (PM) from Refinery Fluid Catalytic Cracking Units; Amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; Amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking; and Certification of a Final Environmental Impact Report Pursuant to the California Environmental Quality Act

Public Comments

No requests received.

Board Comments

None.

Board Action

Director Gioia made a motion, seconded by Director Canepa, to **approve** the Consent Calendar Items 3 through 11, inclusive; and the motion **carried** by the following vote of the Board:

AYES: Abe-Koga, Barrett, Canepa, Chavez, Gioia, Groom, Hudson, Jue, Mandelman, Mitchoff, Rice, Sinks, Spering, Wagenknecht, and Zane.
NOES: None.
ABSTAIN: None.
ABSENT: Bauters, Cutter, Haggerty, Kniss, Kim, Miley, Ronen, Ross, and Sanchez.

COMMITTEE REPORT

12. Report of the **Executive Committee** Meeting of November 19, 2018

NOTED PRESENT: Director Ross was noted present at 10:28 a.m.

Executive Committee Chair, Board Chair Hudson, read the following Committee report:

The Executive Committee met on Monday, November 19, 2018, and approved the minutes of July 23, 2018.

The Committee received the presentation Hearing Board Quarterly Report: July to September 2018.

The Committee then received an update on recent activities of the Bay Area Regional Collaborative.

The Committee then reviewed and discussed the staff presentation Update of Production System Office and Authorization to Execute Contract Amendments for Production System Office. The Committee recommends the Board:

- 1) Authorize the Executive Officer/Air Pollution Control Officer to execute contract amendments with the seven recommended vendors listed in Table 1 of Agenda Item 6, totaling \$1,859,439.*

The Committee then reviewed and discussed the staff presentation Update on Air District Implementation of Assembly Bill 617.

Finally, the Committee then reviewed and discussed the staff presentation Committee Chair Reports on Board of Directors Meeting Agendas. The Committee recommends the Board:

- 1) Provide direction to staff to place Committee reports on Board of Director meetings agendas under the Consent Calendar.*

The next meeting of the Executive Committee will be at the call of the Chair. I move that the Board approve the Executive Committee's recommendations. This concludes the Chair report of the Executive Committee.

Public Comments

No requests received.

Board Comments

None.

Board Action

Chair Hudson made a motion, seconded by Director Spering, to **authorize** the Executive Officer/Air Pollution Control Officer to execute contract amendments with the seven recommended vendors, totaling \$1,859,439; and the motion **carried** by the following vote of the Board:

AYES:	Abe-Koga, Barrett, Canepa, Chavez, Gioia, Groom, Hudson, Jue, Mandelman, Mitchoff, Rice, Ross, Sinks, Spering, Wagenknecht, and Zane.
NOES:	None.
ABSTAIN:	None.
ABSENT:	Bauters, Cutter, Haggerty, Kniss, Kim, Miley, Ronen, and Sanchez.

PRESENTATION

13. **UPDATE ON CANADIAN OIL SANDS CRUDE**

Jack Broadbent, Executive Officer/Air Pollution Control Officer, introduced Victor Douglas, Rule Development and Strategic Policy Manager, who gave the staff presentation *Update on Canadian Oil Sands Crude*, including: overview; what are oil sands; where do oil sands come from; oil sands

extraction processes: in-situ and surface mining; oil sands production: in situ extraction operation examples; oil sands production: surface mining examples; restoration efforts; Canadian perspectives; climate and Bay Area environmental concerns; oil sands versus California crude oil: carbon intensity, American Petroleum Institute gravity, and sulfur versus density; Canadian crude oil imports; mitigating Bay Area environmental concerns; and conclusion.

Following Mr. Douglas' presentation, Damian Breen, Deputy Air Pollution Control Officer for the Technology Section, introduced the following guest speakers: David Collyer, Consultant on behalf of Suncor and Chair of Emissions Reduction Alberta; Tzeborah Berman, Stand.earth; Charlene Aleck, Tsleil-Waututh Nation; and Pennie Opal Plant, Idle No More. The guest speakers addressed the issue of Canadian oil sands crude, and how the proposed Trans Mountain Pipeline expansion to California could affect the Bay Area.

Public Comments

Public comments were given by Rochelle Towers, 1,000 Grandmothers Bay Area; Barbara Rhine, 1,000 Grandmothers Bay Area; Greg Karras, Communities for a Better Environment; Nancy Feinstein, 1,000 Grandmothers Bay Area; Claire Valderama-Wallace, California State University, East Bay; Richard Gray, 350 Bay Area; Charles Davidson, Hercules resident; Mishwa Lee, Northridge Coop Community Garden; and Janet Stromberg, 350 Bay Area.

Board Comments

The Board and staff discussed the rate of oil sands land reclamation in Alberta, Canada, and the Conservation and Reclamation Regulation the Province of Alberta's Environmental Protection And Enhancement Act; imported Canadian crude oil with properties similar to oil sands, and which Bay Area refinery currently imports the greatest volume; the request for additional information on/difficulty in procuring information regarding Canadian crude oil imports; a study called "Oil sands and the Marine Environment: Current Knowledge and Future Challenges," which analyses environmental consequences of bitumen extraction from oil sands deposits; the request for routine updates to the Board on the status of District Rule 12-15; the need to hold polluting facilities accountable of their lack of public information regarding production and exportation of products; the status of District Regulation 11, Rule 18: Reduction of Risk From Air Toxic Emissions at Existing Facilities; the need for ways to extinguish and prevent wildfires; Alberta's withdrawal from Canada's federal climate change plan and how this affects Alberta's provincial policy on climate change; crude oil prices; how limited pipeline capacity (which transports oil out of Alberta) contributes to the discounted prices that America pays Canadian producers; the health risks of exposure to in-situ recovery extraction versus mining; the drag-reducing agent inserted into pipelines to help increase the flow of crude, and how this could be regulated by District Rule 12-15; and oil spills in 2015 and 2017 in Vancouver.

Board Action

None; receive and file.

PUBLIC COMMENT ON NON-AGENDA MATTERS

14. Public Comments on Non-Agenda Items, Pursuant to Government Code Section 54954.3

Public comments were given by Janet Scoll Johnson, Sunflower Alliance; Janet Stromberg, 350 Bay Area; Richard Gray, 350 Bay Area; and Mishwa Lee, San Francisco resident.

BOARD MEMBERS' COMMENTS

15. Board Members' Comments

- Director Sperring requested that staff provides the Board with an update on District Regulation 12, Rule 15: Petroleum Refining Emissions Tracking, specifically, fence line monitoring efforts at refineries.
- Director Gioia reported that over the summer, the wood smoke in Canada was worse than what the Bay Area experienced over the past three weeks, due to multiple 2018 British Columbia wildfires.
- Director Canepa thanked the District for issuing masks to his constituents and requested that staff created a formal mask-distribution plan in the future, so that people will know what to expect from the District.

OTHER BUSINESS

16. Report of the Executive Officer/Air Pollution Control Officer

- Wayne Kino, Deputy Air Pollution Control Officer of Operations, displayed a chart indicating hourly PM_{2.5} concentrations at Bay Area monitors from November 1 to 19, 2018, due to Butte County Fire impacts. Staff added that an anticipated weather system should begin to clear the transported smoke from the Bay Area.
- Mr. Broadbent reported that the District procured a new supply of N95 respirator masks for future public distribution, if and when another wildfire occurs.

17. Chairperson's Report

Chair Hudson congratulated Directors Cutter and Sinks on their recent 2-year reappointments to the Board.

18. Time and Place of Next Meeting

Wednesday, December 19, 2018, at 375 Beale Street, San Francisco, CA 94105 at 9:30 a.m.

19. Adjournment

The meeting adjourned at 1:45 p.m.

Marcy Hiratzka
Clerk of the Boards

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 15, 2018

Re: Board Communications Received from November 19, 2018 through December 18,
2018

RECOMMENDED ACTION

None; receive and file.

DISCUSSION

Copies of communications directed to the Board of Directors received by the Air District from November 19, 2018, through December 18, 2018, if any, will be at each Board Member's place at the December 19, 2018, Board meeting.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Vanessa Johnson

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and
Members of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 15, 2018

Re: Air District Personnel on Out-of-State Business Travel

RECOMMENDED ACTION

None; receive and file.

BACKGROUND

In accordance with Section 5.4 (b) of the Air District's Administrative Code, Fiscal Policies and Procedures Section, the Board is hereby notified of District personnel who have traveled on out-of-state business.

The report covers the out-of-state business travel for the month of November 2018. The monthly out-of-state business travel report is presented in the month following travel completion.

DISCUSSION

The following out-of-state business travel activities occurred in the month of November 2018:

- Jeff McKay, Chief Financial Officer, attended California Desert Air Working Group, Laughlin, Nevada, November 6, 2018 - November 9, 2018.
- Jack P. Broadbent, Executive Officer/APCO, attended EMA DTF Public Policy Forum, Washington, D.C., November 13, 2018 - November 15, 2018.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Stephanie Osaze
Reviewed by: Jeff McKay

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 5, 2018

Re: Notices of Violations Issued and Settlements in Excess of \$10,000 November 2018

RECOMMENDED ACTION

None; receive and file.

DISCUSSION

In accordance with Resolution No. 2012-08, attached to this Memorandum is a listing of all Notices of Violations issued, and all settlements for amounts in excess of \$10,000 during the calendar month prior to this report.

BUDGET CONSIDERATION/FINANCIAL IMPACT

The amounts of civil penalties collected are included in the Air District's general fund budget.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Brian C. Bunger

Attachment 8A: Notices of Violations for the Month of November 2018

AGENDA 8A - ATTACHMMENT

NOTICES OF VIOLATIONS ISSUED

The following Notice(s) of Violations were issued in November 2018:

Alameda						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Air-Sea Containers	Z5324	Oakland	A57882A	11/6/18	2-1-301	No authority to construct.
Air-Sea Containers	Z5324	Oakland	A57882B	11/6/18	2-1-302	No permit to operate.
Golden Gas	C9693	Oakland	A58438A	11/28/18	2-1-302	Expired p/o
Grand Petroleum Inc.	Z5460	Hayward	A58436A	11/27/18	2-1-307	2016 invalid v/c, flowmeter. No st's submitted in 2017, 2018
Oakland Unified School	C0275	Oakland	A58437A	11/27/18	2-1-302	Expired P/O
Oro Loma Sanitary District	A1067	San Lorenzo	A56696A	11/28/18	2-1-307	Failed Source Test conducted on May 1, 2018 by our Source Test Division. Source test# 18169.
R&B Equipment	Z4338	Hayward	A55667A	11/20/18	11-2-401.5	Inaccurate start date.
Recipient	Z5434	Hayward	A56838A	11/19/18	6-3-301	Burning on WSTA
Recipient	Z5438	Hayward	A56843A	11/19/18	6-3-301	Burning on WSTA
Restoration Management Company	Z5380	Hayward	A58496A	11/8/18	11-2-401.3	Inaccurate building type.

Contra Costa						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Air Liquide Large Industries US LP	B7419	Rodeo	A57719A	11/6/18	2-6-307	Source Test OS-6894 sulfuric acid mist mass emissions exceeded P/C 23179 standard.
Carone & Co., Inc.	Z5451	Concord	A57325A	11/26/18	2-1-301	Rock/Concrete Crushing Plant
Carone & Co., Inc.	Z5451	Concord	A57325B	11/26/18	2-1-302	Rock/Concrete Crushing Plant
Chevron Products Company	A0010	Richmond	A58146A	11/5/18	10	flaring at vent gas with h2s > 230mg; 40 CFR 60-104(a)(1) dev 4869
Chevron Products Company	A0010	Richmond	A58147A	11/5/18	10	flaring of unscrubbed vent gas; 40 CFR 60-104 (a)(1) Dev4884
Chevron Products Company	A0010	Richmond	A58148A	11/5/18	10	flaring of unscrubbed vent gas; 40 CFR 60-104(a)(1), dev 4885
Chevron Products Company	A0010	Richmond	A58149A	11/5/18	10	flaring of unscrubbed vent gas; 40 CFR 60-104(a)(1), dev 4893
Chevron Products Company	A0010	Richmond	A58150A	11/5/18	10	flaring of unscrubbed vent gas; 40 CFR 60-104(a)(1), dev 4896
Chevron Products Company	A0010	Richmond	A58151A	11/26/18	8-44-305.3	Missed tower inspection @ RLW; Dev 4920
Chevron Products Company	A0010	Richmond	A58152A	11/26/18	2-6-307	Use of A-632 before start-up notification provided; dev 4915
Chevron Products Company	A0010	Richmond	A58928A	11/26/18	2-6-307	F-1410 exceeded daily flaring rate of 600; pc 469e; dev 4905
Chevron Products Company	A0010	Richmond	A58929A	11/26/18	2-6-307	failed to conduct samples of recovered oil; c25037; dev 4927

Phillips 66 Carbon Plant	A0022	Rodeo	A57720A	11/29/18	2-6-307	Emissions not abated by Baghouse A-11. RCA 07J12
Portola	Z3184	Danville	A58903A	11/15/18	11-2-401.5	Inaccurate start date.
Recipient	Z5425	Antioch	A56830A	11/15/18	6-3-301	Burning on WSTA
Recipient	Z5430	Brentwood	A56836A	11/16/18	6-3-301	Burning on WSTA
Resident	Z5384	Concord	A56342A	11/14/18	6-3-301	Burning on WSTA
Resident	Z5428	Concord	A56833A	11/15/18	6-3-301	Burning on WSTA
Shell Martinez Refinery	A0011	Martinez	A57601A	11/15/18	6-1-302	RCA 07H68 opacity exceeded District and Federal standards.
Shell Martinez Refinery	A0011	Martinez	A57601B	11/15/18	10-40CFR-60.102	10-40CFR-60.102: RCA 07H68 opacity exceeded District and Federal standards.
Shell Martinez Refinery	A0011	Martinez	A57601C	11/15/18	10-40CFR-63.1563	10-40CFR-63.1563: RCA 07H68 opacity exceeded District and Federal standards.
Shell Martinez Refinery	A0011	Martinez	A58603A	11/15/18	6-1-302	RCA 07H70 Opacity excesses.
Shell Martinez Refinery	A0011	Martinez	A58603B	11/15/18	10-40CFR-60.102	10-40CFR-60.102: RCA 07H70 Opacity excesses.
Shell Martinez Refinery	A0011	Martinez	A58603C	11/15/18	10-40CFR-63.1563	10-40CFR-63.1563: RCA 07H70 Opacity excesses.
Tri-City Concrete	Z5450	Martinez	A57324A	11/26/18	2-1-301	No A/C

Tri-City Concrete	Z5450	Martinez	A57324B	11/26/18	2-1-302	No P/O
West Contra Costa County Landfill	A1840	Point Richmond	A56501A	11/8/18	2-6-307	Operation below temp PC #05771-10
West Contra Costa County Landfill	A1840	Point Richmond	A56502A	11/19/18	2-6-307	Failed Source Test (OS-7059).

Marin						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Iman of the Islamic Society of CAL	Z5426	Fairfax	A56831A	11/15/18	6-3-301	Burning on WSTA
Resident	Z5388	San Anselmo	A56344A	11/14/18	6-3-301	Burning on WSTA

Napa						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Craig/Amy Warren	X0382	Napa	A56834A	11/16/18	6-3-301	Burning on WSTA
Recipient	Z5382	Napa	A56341A	11/14/18	6-3-301	Burning on WSTA
Recipient	Z5427	Napa	A56832A	11/15/18	6-3-301	Burning on WSTA
Silverado Country Club and Resort	Z5323	Napa	A58564A	11/6/18	8-7-301.13	CARB Method TP-201.3 - not conducted within 12 months of each other.

San Francisco

Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Ace Drilling & Excavation	Z5468	San Francisco	A58498A	11/14/18	11-2-401.5	Inaccurate start date
Ace Drilling & Excavation	R3799	San Francisco	A58499A	11/14/18	11-2-401.5	Inaccurate start date.
Aralon Properties	Z5453	San Francisco	A58500A	11/27/18	11-2-401.5	Inaccurate start date, J#ASB100682

San Mateo

Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Iris Jean McCleod	Z5368	Belmont	A56340A	11/14/18	6-3-301	Burning on WSTA
Magic Auto Paint & Body	A5322	Redwood City	A58022A	11/7/18	2-1-302	Expire permit
Resident	Z5387	San Mateo	A56343A	11/14/18	6-3-301	Burning on WSTA
SFD	Z5423	La Honda	A55666A	11/20/18	11-2-401.3	Late notification for demolition.
Steven & Christine Wolf	V6993	East Palo Alto	A56835A	11/16/18	6-3-301	Burning on WSTA

Santa Clara						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Buccaneer Demolition	Z5455	San Jose	A58419A	11/28/18	11-2-401.5	11-2-401.5 failure to revise. ASB103922, 103920, 103919, 103916, 103735
Buccaneer Demolition	Z5455	San Jose	A58510A	11/26/18	11-2-401.5	Inaccurate start date (+1139 Minnesota Ave, SJ, 95125) J#'s ASB104387, ASB104392
International Disposal Corp of CA	A9013	Milpitas	A56527A	11/28/18	2-6-307	Non-compliance permit condition
Kirby Petroleum Inc	Z5213	Los Gatos	A57673A	11/5/18	2-1-307	Gasoline throughput limit exceeded.
Northrop Grumman Systems Corporation	B0861	Sunnyvale	A58213A	11/8/18	1-522	Failure to report on time.
Recipient	Z5431	San Jose	A56837A	11/19/18	6-3-301	Burning on WSTA
Recipient	Z5437	San Jose	A56840A	11/19/18	6-3-301	Burning on WSTA
Recipient	Z5435	Los Altos	A56842A	11/19/18	6-3-301	Burning on WSTA
Tilton Pacific Construction	Z5413	San Jose	A58509A	11/19/18	11-2-401.5	Inaccurate start date.

Solano						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Fairgrounds Gas Station	Z4535	American Canyon	A58563A	11/2/18	8-7-302.2	Did not install Healy hoses to low-permeation hoses.

Flyers Valero	Z5353	Fairfield	A58566A	11/8/18	8-7-408	AQ Source Test results have not been received - passed 30 days.
G&M Oil Company	Z4831	Vallejo	A58565A	11/7/18	8-7-307	Nozzle instructions not posted on dispensers.
Nexeo Solutions, LLC	A7618	Fairfield	A56443A	11/19/18	2-1-307	E07F97 / Tank emissions not vented to bladder tank.
Pal Gas	Z5328	Vallejo	A58568A	11/16/18	8-7-306	Tag #61565 was removed when same non-reattachable breakaway installed disp #8
Pal Gas	Z5328	Vallejo	A58568B	11/16/18	8-7-302.2	Tag #61565 was removed when same non-reattachable breakaway installed disp #8
Valero Refining Company - California	B2626	Benicia	A57349A	11/29/18	1-522.4	Late reporting of Inoperative CEMS monitor.
Valero Refining Company - California	B2626	Benicia	A57350A	11/29/18	1-523.3	Late reporting of a parametric monitor violation.

Sonoma						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
24/7 Gas Service Co.	Z5354	Cotati	A57674A	11/7/18	2-1-307	VR-204 annual tests overdue (last tested 7/21/2017)
24/7 Gas Service Co.	Z5354	Cotati	A57674B	11/7/18	8-7-315	Pressure vent valve not certified under CARB VR-101
CVE NB Contracting Group Inc.	Z5329	Rohnert Park	A55936A	11/7/18	11-2-401.5	Failure to update start date prior to 11/6/18
Derlin & Cheryl German	Z5440	Petaluma	A56845A	11/19/18	6-3-301	Burning on WSTA
Mitchell Riedel	Z2334	Santa Rosa	A56841A	11/19/18	6-3-301	Burning on WSTA

Way Family Trust	Z5439	Santa Rosa	A56844A	11/19/18	6-3-301	Burning on WSTA
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District Wide						
Site Name	Site #	City	NOV #	Issuance Date	Regulation	Comments
Pantano Demolition	W6489	Manteca	A58497A	11/14/18	11-2-401.5	Inaccurate start date.
KAG West	Y8346	West Sacramento	A54291A	11/16/18	8-33-304.1	CT# 200148, Failure to meet vapor Integrity requirement.
KAG West	Y8346	West Sacramento	A54292A	11/16/18	8-33-304.6	CT#200509, Failure to meet vapor tight requirement.
KAG West	Y8346	West Sacramento	A54293A	11/16/18	8-33-304.6	CT# 202194, Failure to meet vapor tight requirement.

SETTLEMENTS FOR \$10,000 OR MORE REACHED

There was one (1) settlement for \$10,000 or more completed in October 2018.

- 1) On October 1, 2018, the Air District reached settlement with Andy’s BP for \$16,000, regarding the allegations contained in the following 1 Notice of Violation:

NOV #	Issuance Date	Occurrence Date	Regulation	Comments from Enforcement
A56633A	2/9/17	3/1/14	2-1-302	NPS#112598 Expired Permit to Operate

There were four (4) settlement(s) for \$10,000 or more completed in November 2018.

- 1) On November 5, 2018, the Air District reached settlement with City of Santa Rosa Wastewater Treatment Plant for \$12,000, regarding the allegations contained in the following 1 Notice of Violation:

NOV #	Issuance Date	Occurrence Date	Regulation	Comments from Enforcement
A56123A	12/4/17	8/9/17	2-6-307	Dev 4979 Permit Cond 18871 gas vent

2) On November 5, 2018, the Air District reached settlement with Chevron U.S.A. Inc. for \$222,000, regarding the allegations contained in the following 49 Notices of Violation:

NOV #	Issuance Date	Occurrence Date	Regulation	Comments from Enforcement
A54269A	4/21/16	1/19/16	2-6-307	Episode #06X83; PC #11066. Part 7; 40 CFR 60 104 (a)(1) flaring
A54269B	4/21/16	1/19/16	10	Episode #06X83; PC #11066. Part 7; 40 CFR 60 104 (a)(1) flaring
A56424A	10/26/17	10/25/17	1-301	Five confirmed odor complaints.
A56804A	7/14/16	3/18/16	2-6-307	Drop in TR set 7B current; violation of PC 11066 7A5
A56813A	8/3/16	3/29/16	1-301	Flaring f6 with H2S>7 2000 ppm; 8 complaints to AQMD
A56813B	8/3/16	3/29/16	9-2-301	Flaring f6 with H2S>7 2000 ppm; 8 complaints to AQMD
A56815A	9/22/16	6/20/16	2-6-307	Esp temp deviation & PC 11066 (7A); Dev 4578
A56816A	9/22/16	4/2/16	8-10-501	Failure to monitor process vessel prior to opening
A56816B	9/22/16	4/2/16	8-10-501	Failure to monitor process vessel prior to opening
A56817A	9/22/16	6/2/14	8-18-404	Failed to monitor valve on Quarterly basis; Dev 4430
A56817B	9/22/16	6/2/14	8-18-401.2	Failed to monitor valve on Quarterly basis; Dev 4430
A56822A	1/23/17	6/21/16	6-1-302	Opacity D 20% for > 3 minutes @ ESP; Dev 4512; RCA 06Z58
A56823A	1/23/17	9/3/16	6-1-301	Visible emission from NISO flare
A56823B	1/23/17		6-1-301	
A56826A	3/21/17	12/12/16	9-10-504	blocked in fuel flow meter @ F-447; RCA 07B30; DEV 4726
A56826B	3/21/17	12/12/16	1-523.1	Failed to report the new operating fuel flow meter
A56827A	3/21/17	12/11/16	9-10-504	Blocked in fuel flow meter @F-410; RCA A0729; DEV 4727
A56827B	3/21/17	12/11/16	1-523.1	Flow meter blinded off and non-operating

A57153A	3/21/17	12/12/16	1-523.1	Fuel flow meter @ F-210 blocked + plugged; RCA 07B31 Dev4752
A57153B	3/21/17	12/12/16	1-523.2	Fuel flow meter @ F-210 blocked + plugged; RCA07B31 Dev 4752
A57155A	3/21/17	12/12/16	1-523.1	fuel flow meter @ F-247 blocked + equalizer line open to atm; RCA07B32; Dev 4730
A57155B	3/21/17	12/12/16	9-10-504	fuel flow meter at F-247 blocked plus equalizer line open to atm; RCA07B32; Dev 4730
A57159A	6/7/17	2/6/17	10	>160ppm H2S in V-475&V-701;S-4155 consumed fuel w/ >50ppm H2S (24 hr); RCAs 07C14, 07C16, 07C19
A57159B	6/7/17	2/6/17	2-6-307	>160ppm H2S in V-475+V-701;S-4155 consumed fuel w/ >50ppm H2S (24 hr); RCA's: 07C14, 07C16, 07C19
A57160A	6/5/17	7/25/15	10	Flaring @ LSFO; H2S>230 mg/dscm; DEV 4280
A57161A	6/5/17	8/27/15	10	Flaring @ FCC flare; > 230 mg/dscm H2S; Dev 4305
A57162A	6/5/17	10/10/15	10	Flaring @ LSFO; H2S>230 mg/dscm; DEV 4334
A57163A	6/5/17	10/10/15	10	Flaring @ Alky flare; H2S > 230 mg/dscm; Dev 4386
A57164A	6/15/17	8/17/16	2-6-307	Alky CWT flow meter inop > 15 consecutive days; failed to notify 1 working day; Dev 4612 & 4722
A57164B	6/15/17	8/17/16	1-523.1	Alky CWT flow meter inop > 15 consecutive days; failed to notify 1 working day; Dev 4612 & 4722
A57164C	6/15/17	8/17/16	1-523.2	Alky CWT flow meter inop > 15 consecutive days; failed to notify 1 working day; Dev 4612 & 4722
A57165A	6/15/17	8/6/15	10	Flaring @ FCC & NISO flares; H2S > 230 mg/dscm; Dev 4286
A57166A	6/15/17	10/7/15	10	Flaring @ FCC flare; H2S > 230 mg/dscm; Dev 4333
A57167A	6/15/17	12/7/15	10	Flaring @ LSFO flare; H2S > 230mg/dscm; Dev 4385
A57169A	7/18/17	2/8/16	10	flaring at FCC flare; H2S>230 mg/dscm; dev 4439
A57171A	7/18/17	4/22/16	10	flaring at FCC flare; H2S>230 mg/dscm; dev 4521
A57173A	8/1/17	9/12/16	10	Flaring @ FCC; H2S > 230 mg/dscm; dev 4633
A57174A	8/1/17	9/12/16	10	Flaring @ FCC; NISO; SISO flare; H2S > 230 mg/dscm; dev 4632

A57175A	8/1/17	8/5/16	10	Flaring @ FCC; SISO; NISO; H2S > 230 mg/dscm; dev 4601
A57176A	8/1/17	8/14/16	10	Flaring @ FCC & RLOP flares; H2S > 230 mg/dscm; dev 4606
A57177A	8/1/17	1/27/17	10	Flaring @ FCC; H2S > 230 mg/dscm; dev 4785
A57528A	9/12/17	12/27/16	10	H2S Conc. > 230 mg/dscm in V-870; dev 4743
A57529A	9/12/17	12/28/16	2-6-307	NOx emissions > 40ppm @3% O2 for F-1361; dev 4788 & 4739
A57530A	9/12/17	1/7/17	10	Flaring @ FCC; H2S > 230 mg/dscm; dev 4760
A57532A	9/12/17	2/8/17	10	Flaring @ FCC flare; H2S > 230 mg/dscm; dev 4794
A57533A	9/12/17	3/28/17	10	Flaring @ FCC flare; H2S > 230 mg/dscm; dev 4819
A57534A	11/29/17	2/8/17	2-6-307	FCC ESP TR Set current < limit, RCA 07C42; Dev 4796
A57535A	11/29/17	2/8/17	2-6-307	FCC ESP Temp < limit; RCA 07C20. Dev 4797.
A57536A	11/29/17	1/23/17	12-11-506.1	LSFO flare sample pump inop > 24hrs w/o notification, DEV 4798, RCA 07C33
A57537A	11/29/17	12/14/16	1-522.7	F-210 operated with elevated CO emissions & failed to notify on time RCA 07B94, Dev 4773
A57537B	11/29/17	12/14/16	9-10-305	F-210 operated with elevated CO emissions & failed to notify on time RCA 07B94, Dev 4773
A57538A	11/29/17	12/29/16	1-522.7	Failed to notify within 96hrs of indicated excess Dev 4773; RCA 07B95
A57539A	1/22/18	1/3/17	1-522.7	Failed to report indicated NOx excess @ F-1160 w/in 96hrs; title V dev 4753
A57540A	1/22/18	6/24/17	2-6-307	ESP TR set current below limits (P/C 11066 7A5); Title V std cond F, failed to report w/in 10 days
A57543A	2/26/18	11/13/16	2-6-307	Loss of WGC @ FCC; RCA 07A93
A57544A	2/26/18		8-10-501	Failed to monitor for 3rd day during PVD; Dev# 4339
A57546A	2/26/18	4/3/16	2-6-307	Failed to notify of shutdown as required Std. Cond. J(3); Dev# 4496
A57547A	2/26/18	4/29/15	10	flaring w/o scrubbing of H2S; 40 CFR 60.104(a)(1); Dev# 4219
A57548A	3/14/18	5/13/15	10	Open-ended line discovered @ #4 Rhen; Deviation 4429

A57551A	3/14/18	5/2/12	2-6-307	Failed tom submit component counts plus inspect components quarterly; Dev 4409
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- 3) On November 16, 2018, the Air District reached settlement with PG&E Gateway Generating Station for \$10,000, regarding the allegations contained in the following 1 Notice of Violation:

NOV #	Issuance Date	Occurrence Date	Regulation	Comments from Enforcement
A56925A	5/7/2018	10/27/2017	2-6-307	NOx excess at S#41 exceeded P/C#18138 limit

- 4) On November 27, 2018, the Air District reached settlement with MFAS Homes Development for \$30,000, regarding the allegations contained in the following 1 Notice of Violation:

NOV #	Issuance Date	Occurrence Date	Regulation	Comments from Enforcement
A58409A	7/12/18	7/2/18	11-2-303	Demolition with RACM in place and No on-site representative
A58409B	7/12/18		11-2-304	RACM waste not in leak-tight labeled containers, Improper Disposal, and No waste shipment records

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 6, 2018

Re: Proposed Regulatory Agenda for 2019

RECOMMENDED ACTION

None; receive and file.

DISCUSSION

Each year, the Air District is required by Health and Safety Code section 40923 to publish a list of regulatory measures scheduled or tentatively scheduled for consideration during the next calendar year. If a measure is not on this list, it may not be brought before the Board of Directors unless it is necessary to:

1. Satisfy federal requirements;
2. Abate a substantial endangerment to public health or welfare;
3. Comply with state toxic air contaminant requirements;
4. Comply with California Air Resources Board (CARB) requirement that the Air District adopt contingency measures due to inadequate progress towards attainment;
5. Preserve an existing rule's "original intent;" or
6. Allow for alternative compliance under an existing rule.

The attached list includes all measure that may come before the Board in calendar year 2019. Some of the measures may fall within exceptions listed above but are nevertheless included for completeness. It is very unlikely that all the measures on the list will be enacted during the calendar year. Rules are listed in numerical order as they appear in the Air District Rules and Regulations.

All new rules and rule amendments must be adopted at a public hearing conducted by the Board of Directors of the Air District. Public comment is accepted at these hearings. Public notice of hearings is provided as required by law. In addition, the Air District staff typically conducts public workshops and provides opportunities for oral and written comments before scheduling a rule for public hearing for the Board's consideration. Information on workshops, hearings, and other rule development issues may be obtained from the Air District website.

BUDGET CONSIDERATION/FINANCIAL IMPACT

None.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Victor Douglas
Reviewed by: Greg Nudd

Attachment 9A: Bay Area Air Quality Management District 2019 Regulatory Measures List

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
PROPOSED REGULATORY AGENDA
CALENDAR YEAR 2019**

Regulation, Rule	Title	Objectives ¹
Reg. 1	General Provisions and Definitions	Clarify and enhance District policies, definitions
Reg. 2, Rule 1	General Requirements (Permits)	GHG threshold, community health protection
Reg. 2, Rule 2	New Source Review	GHG threshold, community health protection
Reg. 2, Rule 4	Emissions Banking	Community health protection
Reg. 2, Rule 5	New Source Review for Toxic Air Contaminants	Clarifications, community health protection
Reg. 2, Rule 9	Interchangeable Emission Reduction Credits	Community health protection
Reg. 2, Rule TBD	Biogas Flares	Reduce emissions
Reg. 3	Fees	Cost recovery
Reg. 4	Air Pollution Episode Plan	Reduce emissions
Reg. 5	Open Burning	Reduce emissions
Reg. 6	General Provisions	Standardize administrative requirements
Reg. 6, Rule 1	Particulate Matter, General Limitations	Reduce emissions
Reg. 6, Rule 2	Commercial Cooking Devices	Reduce emissions
Reg. 6, Rule 3	Wood Burning Devices	Clarifications, reduce emissions
Reg. 6, Rule 5	Fluid Catalytic Cracking Units	AB 617 BARCT, changes to address legal concerns
Reg. 6, Rule 6	Prohibition of Trackout	Reduce emissions
Reg. 6, Rule TBD	Glass Melting and Forming Operations	Reduce emissions
Reg. 6, Rule TBD	Coal and Petroleum Coke Handling Operations	Reduce emissions
Reg. 6, Rule TBD	Reduction of Risk from Particulate Matter	Reduce emissions and risk
Reg. 7	Odororous Substances	Clarifications, reduce emissions
Reg. 8, Rule 1 and others	General Provisions	Applicability, VOC definition, remove methane exemption if applicable
Reg. 8, Rule 2	Miscellaneous Operations	Clarifications
Reg. 8, Rule 3	Architectural Coatings	Clarifications, flexibility
Reg. 8, Rule 4	General Solvent and Surface Coating Operations	Clarifications, reduce emissions
Reg. 8, Rule 5	Storage of Organic Liquids	AB 617 BARCT, reduce emissions
Reg. 8, Rule 6	Organic Liquid Bulk Terminals and Bulk Plants	Clarifications, reduce emissions
Reg. 8, Rule 7	Gasoline Dispensing Facilities	Reduce emissions

Regulation, Rule	Title	Objectives ¹
Reg. 8, Rule 8	Wastewater Collection and Separation Systems	AB 617 BARCT, clarifications, definitions, emission reductions
Reg. 8, Rule 9	Vacuum Producing Systems	Clarifications, definitions
Reg. 8, Rule 10	Process Vessel Depressurization	Clarifications, definitions, reduce emissions
Reg. 8, Rule 11	Metal Container, Closure and Coil Coating	Clarifications, definitions, reduce emissions
Reg. 8, Rule 12	Paper, Fabric and Film Coating	Clarifications, definitions, reduce emissions
Reg. 8, Rule 13	Light and Medium Duty Motor Vehicle Assembly Plants	Clarifications, definitions, reduce emissions
Reg. 8, Rule 14	Surface Preparation and Coating of Large Appliances and Metal Furniture	Clarifications, definitions, reduce emissions
Reg. 8, Rule 15	Emulsified and Liquid Asphalts	Reduce emissions
Reg. 8, Rule 16	Solvent Cleaning Operations	Clarifications, reduce emissions
Reg. 8, Rule 18	Equipment Leaks	AB 617 BARCT, clarifications, definitions, applicability
Reg. 8, Rule 19	Surface Preparation and Coating of Miscellaneous Metal Parts and Products	Clarifications, definitions, reduce emissions
Reg. 8, Rule 20	Graphic Arts Operations	Clarifications, reduce emissions, EPA policy
Reg. 8, Rule 21	Rubber Tire Manufacturing Operations	Clarifications, definitions
Reg. 8, Rule 22	Valves and Flanges at Chemical Plants	Clarifications, definitions
Reg. 8, Rule 23	Coating of Flat Wood Paneling and Wood Flat Stock;	Clarifications, definitions, reduce emissions
Reg. 8, Rule 24	Pharmaceutical and Cosmetic Manufacturing Operations;	Clarifications, definitions, reduce emissions
Reg. 8, Rule 26	Magnet Wire Coating Operations	Clarifications, definitions, reduce emissions
Reg. 8, Rule 28	Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants	Clarifications, flexibility, definitions, reduce emissions
Reg. 8, Rule 29	Aerospace Assembly and Component Coating Operations	Clarifications, definitions, reduce emissions
Reg. 8, Rule 30	Semiconductor Manufacturing Operations	Reduce emissions
Reg. 8, Rule 31	Surface Coating of Plastic Parts and Products	Clarifications, definitions, reduce emissions
Reg. 8, Rule 32	Wood Products Coatings	Clarifications, flexibility, reduce emissions
Reg. 8, Rule 33	Gasoline Bulk Terminals and Gasoline Delivery Vehicles	Clarifications
Reg. 8, Rule 34	Solid Waste Disposal Sites	Climate protection, reduce emissions
Reg. 8, Rule 35	Coating, Ink and Adhesive Manufacturing	Clarifications, definitions, reduce emissions
Reg. 8, Rule 36	Resin Manufacturing	Clarifications, definitions, reduce emissions

Regulation, Rule	Title	Objectives ¹
Reg. 8, Rule 37	Natural Gas and Crude Oil Production Facilities	Reduce emissions, consistency with ARB standards, definitions
Reg. 8, Rule 38	Flexible and Rigid Disc Manufacturing	Clarifications, VOC definition, reduce emissions
Reg. 8, Rule 39	Gasoline Bulk Plants and Gasoline Delivery Vehicles	Clarifications
Reg. 8, Rule 40	Aeration of Contaminated Soil and Removal of Underground Storage Tanks	Clarifications, definitions
Reg. 8, Rule 41	Vegetable Oil Manufacturing Operations	Clarifications, definitions
Reg. 8, Rule 43	Surface Preparation and Coating of Marine Vessels	Clarifications, definitions, reduce emissions
Reg. 8, Rule 44	Marine Vessel Loading	Clarifications, reduce emissions
Reg. 8, Rule 45	Motor Vehicle and Mobile Equipment Coating Operations	Clarifications, flexibility
Reg. 8, Rule 46	Marine Tank Vessel to Marine Tank Vessel Loading	Clarifications
Reg. 8, Rule 47	Air Stripping and Soil Vapor Extraction Operations	Clarifications, organic compound definition
Reg. 8, Rule 49	Aerosol Paint Products	Clarifications, consistency with ARB standards, reduce emissions
Reg. 8, Rule 50	Polyester Resin Operations	Clarifications
Reg. 8, Rule 51	Adhesive and Sealant Products	Clarifications, reduce emissions
Reg. 8, Rule 52	Polystyrene, Polypropylene and Polyethylene Foam Product Manufacturing Operations.	Clarifications
Reg. 8, Rule 53	Vacuum Truck Operations	Clarifications
Reg. 8, Rule TBD	Green Waste Operations	Reduce emissions
Reg. 8, Rule TBD	Livestock Waste/Confined Animal Facilities	Reduce emissions
Reg. 8, Rule TBD	Digital Printing	Reduce emissions
Reg. 8, Rule TBD	Natural Gas Transmission and Distribution	Reduce emissions
Reg. 8, Rule TBD	Wastewater from Coke Cutting	Reduce emissions
Reg. 8, Rule TBD	Wineries	Reduce emissions
Reg. 8, Rule TBD	Vanishing Oils and Rust Inhibitors	Reduce emissions
Reg. 8, Rule TBD	LPG, Propane, Butane, and other Pressurized Gases	Reduce emissions
Reg. 9, Rule 1	Sulfur Dioxide	Monitoring, recording requirements, reduce emissions
Reg. 9, Rule 2	Hydrogen Sulfide	Monitoring, recording requirements, reduce emissions
Reg. 9, Rule 4	NOx from Fan Type Residential Central Furnaces	Reduce emissions
Reg. 9, Rule 6	NOx from Natural Gas-Fired Water Heaters	Clarifications, reduce emissions
Reg. 9, Rule 7	NOx and CO from Boilers, Steam Generators and Process Heaters	Clarifications, reduce emissions

Regulation, Rule	Title	Objectives ¹
Reg. 9, Rule 8	Stationary IC Engines	Clarifications, reduce emissions
Reg. 9, Rule 9	Stationary Gas Turbines	Reduce emissions
Reg. 9, Rule 10	Refinery boilers, steam generators and process heaters	Reduce emissions
Reg. 9, Rule 12	NOx, SO ₂ and Particulate from Glass Melting Furnaces	Reduce emissions
Reg. 9, Rule 13	NOx, Particulate Matter and Toxic Air Contaminants from Cement Kilns	AB 617 BARCT, clarifications, reduce emissions
Reg. 9, Rule 14	SOx from Petroleum Coke Calcining	AB 617 BARCT, reduce emissions
Reg. 9, Rule TBD	NOx from Kilns, Ovens and Furnaces	Reduce emissions
Reg. 9, Rule TBD	NOx from Large Residential and Commercial Space Heating	Reduce emissions
Reg. 9, Rule TBD	Sulfur content for gaseous fuels	Reduce emissions
Reg. 9, Rule TBD	Sulfur content for liquid fuels	Reduce emissions
Reg. 10	Standards of Performance for New Stationary Sources	Federal standards update
Reg. 11	Hazardous Air Pollutants	Reference federal standards
Reg. 11, Rule 1	Lead	Clarifications, reference federal standards
Reg. 11, Rule 2	Asbestos Demolition, Lead Paint Removal, Renovation and Manufacturing	Clarifications
Reg. 11, Rule 10	Hexavalent Chromium from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers	Clarifications, changes to address legal concerns
Reg. 11, Rule 14	Asbestos-Containing Serpentine	Clarifications
Reg. 11, Rule TBD	Backup Generators	Reduce emissions and risk
Reg. 12, Rule 11	Flare Monitoring at Petroleum Refineries	Clarifications, reduce emissions
Reg. 12, Rule 12	Flares at Petroleum Refineries	Reduce emissions
Reg. 12, Rule 15	Refinery Emissions Tracking	Monitor emissions, assess health impacts
Reg. 12, Rule 16	Petroleum Refining Facility-Wide Emissions Limits	Ensure that some refinery emissions do not increase
Reg. 13	Climate Pollutants	Climate protection, tracking of associated pollutants
Reg. 13, Rule 1	Significant Methane Releases	Climate protection
Reg. 13, Rule 2	Organic Materials Handling	Climate protection
Reg. 13, Rule 3	Composting Operations	Climate protection
Reg. 13, Rule 4	Sewage Treatment Facilities and Anaerobic Digesters	Climate protection
Reg. 13, Rule TBD	Methane Reductions at Refineries	Climate protection
Reg. 13, Rule TBD	Short-Lived Climate Pollutants	Climate protection
Reg. 13, Rule TBD	Heat Mitigating Technologies Deployment	Climate protection
Reg. 13, Rule TBD	Energy Use in Residential, Commercial and Industrial Sectors	Climate protection
Reg. 13, Rule TBD	Livestock Waste	Climate protection

Regulation, Rule	Title	Objectives ¹
Reg. 14, Rule 1	Commuter Benefits Program	Legislative update
Reg. 15:	Disaster Preparedness & Response Program	Reduce emissions, respond to emergencies
Reg. and Rule TBD	Indirect Source Review	Reduce emissions
Reg. and Rule TBD	Episodic Controls	Reduce emissions
Reg. and Rule TBD	Sulfur Hexafluoride	Reduce emissions
Reg. and Rule TBD	Refrigeration Management	Climate protection, reduce emissions
Reg. and Rule TBD	Magnet Source Rule	Reduce emissions
Reg. and Rule TBD	Emergency Stand-by Stationary IC Engines	Reduce emissions
Reg. and Rule TBD	Refinery Fuel Gas	Reduce emissions
Reg. and Rule TBD	Limiting Health Impacts from Particulate Matter Pollution	Reduce emissions and health impacts
Reg. and Rule TBD	Sulfuric Acid Plants	Reduce emissions
Reg. and Rule TBD	Sulfur Plants	Reduce emissions
Reg. and Rule TBD	Refinery Delayed Cokers	Reduce emissions
Reg. and Rule TBD	Methane and Air Toxics from Oil & Gas Capped Wells	Reduce emissions
Reg. and Rule TBD	Ammonia from Stationary Sources	Reduce emissions
Reg. and Rule TBD	Sample and Analyze Episodic Event Plumes	Monitor emissions, assess health impacts
Reg. and Rule TBD	Impacts of Crude Changes Upstream of Crude Units	Improve enforceability
Reg. and Rule TBD	Start-up, Shutdown & Malfunction Emissions	Reduce emissions
Reg. and Rule TBD	Refinery Emissions Best Practices Backstop Rule	Reduce emissions
Reg. and Rule TBD	Periodic Assessment of Significant Emission Sources	Reduce emissions
Reg. and Rule TBD	AB 617 BARCT Plan	Community health protection
Reg. and Rule TBD	AB 617 Community Emissions Reduction Plans	Community health protection
MOP, Volume I	Enforcement Procedures	Clarification, improve data submittals
MOP, Volume II	Engineering Permitting Procedures	Consistency with EPA requirements, clarifications
MOP, Volume III	Laboratory Methods	New and improved analytical procedures
MOP, Volume IV	Source Test Methods	New and improved analytical procedures
MOP, Volume V	Continuous Emission Monitoring	New and improved analytical and monitoring procedures
MOP, Volume VI	Ground Level Monitoring	Consistency with EPA requirements
New MOP, Volume X	Procedures for Evaluating and Lists of Non-Precursor Organic Compounds, Group I and Group II	Evaluation and listing of NPOCs

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- 1 Objectives are listed for information only and are subject to change. Rule development efforts for a rule are not limited to listed objectives.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 10, 2018

Re: Report of the Mobile Source Committee Meeting of December 17, 2018

RECOMMENDED ACTION

The Mobile Source Committee (Committee) recommends Board of Directors' approval of the following items:

- A) Projects and Contracts with Proposed Grant Awards Over \$100,000
 - 1) Approve recommended projects with proposed grant awards over \$100,000 as shown in Attachment 1; and
 - 2) Authorize the Executive Officer/Air Pollution Control Officer (APCO) to enter into all necessary agreements with applicants for the recommended projects.
- B) Fiscal Year Ending (FYE) 2017 Transportation Fund for Clean Air (TFCA) Program Audit Results
 - 1) None; receive and file.
- C) Report on TFCA Projects Expenditures and Effectiveness for Fiscal Year Ending (FYE) 2018.
 - 1) None; receive and file.

BACKGROUND

The Committee will meet on Monday, December 17, 2018, and will receive the following reports:

- A) Projects and Contracts with Proposed Grant Awards Over \$100,000;
- B) FYE 2017 TFCA Program Audit Results; and
- C) Report on TFCA Projects Expenditures and Effectiveness for FYE 2018.

Chairperson Scott Haggerty will provide an oral report of the Committee meeting.

BUDGET CONSIDERATION/FINANCIAL IMPACT

- A) None. The Air District distributes Carl Moyer Program, Mobile Source Incentive Fund, Community Health Protection Grant Program, and TFCA funding to public agencies and private entities on a reimbursement basis. Funding for administrative costs is provided by each funding source;
- B) None. Administrative costs for the TFCA audit and staff are provided by the funding source.
- C) None. The Air District distributes TFCA monies as “pass-through” funds to public and nonpublic entities. Administrative costs for project staff are provided by the Air District’s TFCA funding.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Marcy Hiratzka
Reviewed by: Vanessa Johnson

Attachment 10A: 12/17/18 – Mobile Source Committee Meeting Agenda #4
Attachment 10B: 12/17/18 – Mobile Source Committee Meeting Agenda #5
Attachment 10C: 12/17/18 – Mobile Source Committee Meeting Agenda #6

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson Scott Haggerty and Members
of the Mobile Source Committee

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 4, 2018

Re: Projects and Contracts with Proposed Grant Awards Over \$100,000

RECOMMENDED ACTION

Recommend Board of Directors:

1. Approve recommended projects with proposed grant awards over \$100,000 as shown in Attachment 1; and
2. Authorize the Executive Officer/APCO to enter into all necessary agreements with applicants for the recommended projects.

BACKGROUND

The Bay Area Air Quality Management District (Air District) has participated in the Carl Moyer Program (CMP), in cooperation with the California Air Resources Board (CARB), since the program began in Fiscal Year 1998-1999. The CMP provides grants to public and private entities to reduce emissions of oxides of nitrogen (NOx), reactive organic gases (ROG) and particulate matter (PM) from existing heavy-duty engines by either replacing or retrofitting them. Eligible heavy-duty diesel engine applications include on-road trucks and buses, off-road equipment, marine vessels, locomotives, and stationary agricultural pump engines.

Assembly Bill 923 (AB 923 - Firebaugh), enacted in 2004 (codified as Health and Safety Code (HSC) Section 44225), authorized local air districts to increase their motor vehicle registration surcharge up to an additional \$2 per vehicle. The revenues from the additional \$2 surcharge are deposited in the Air District's Mobile Source Incentive Fund (MSIF). AB 923 stipulates that air districts may use the revenues generated by the additional \$2 surcharge for projects eligible under the CMP.

In 2017, Assembly Bill 617 (AB 617) directed the CARB, in conjunction with local air districts to establish the Community Air Protection Program. AB 617 provides a new community-focused action framework to improve air quality and reduce exposure to criteria air pollutants and toxic air contaminants in communities most impacted by air pollution. In advance of the development of the Community Air Protection Program, the Governor and legislature established an early action component to AB 617 to use existing incentive programs to get immediate emission reductions in

the communities most affected by air pollution. Assembly Bill 134 (AB 134) (2017) appropriated \$250 million from the Greenhouse Gas Reduction Fund (GGRF) to reduce mobile source emissions including criteria pollutants, toxic air contaminants, and greenhouse gases in those communities. The Bay Area has been allocated \$50 million of these funds for emission reduction projects. These funds will be used to implement projects under the CMP, and optionally for on-road truck replacements under the Proposition 1B Goods Movement Emission Reduction Program.

On February 21, 2018, the Board of Directors (Board) authorized Air District participation in Year 20 of the CMP, and authorized the Executive Officer/APCO to execute Grant Agreements and amendments for projects funded with CMP funds or MSIF revenues, with individual grant award amounts up to \$100,000.

In 1991, the California State Legislature authorized the Air District to impose a \$4 surcharge on motor vehicles registered within the nine-county Bay Area to fund projects that reduce on-road motor vehicle emissions within the Air District's jurisdiction. The statutory authority for the Transportation Fund for Clean Air (TFCA) and requirements of the program are set forth in the HSC Sections 44241 and 44242. 60% of TFCA funds are awarded by the Air District to eligible projects and programs implemented directly by the Air District (e.g., Spare the Air, electric vehicle charging station program) and to a program referred to as the TFCA Regional Fund. Each year, the Board allocates funding and adopts policies and evaluation criteria that govern the expenditure of TFCA funding.

On May 2, 2018, the Board authorized funding allocations for use of TFCA revenue in Fiscal Year Ending (FYE) 2019 and cost-effectiveness limits for Air District-sponsored FYE 2019 programs and authorized the Executive Officer/APCO to execute grant agreements and amendments for TFCA-revenue funded projects with individual grant award amounts up to \$100,000. On June 6, 2018, the Board adopted policies and evaluation criteria for the FYE 2019 TFCA Regional Fund program.

Projects with grant award amounts over \$100,000 are brought to the Mobile Source Committee for consideration at least on a quarterly basis. Staff reviews and evaluates grant applications based upon the respective governing policies and guidelines established by the CARB and the Board.

DISCUSSION

Carl Moyer Program and Community Health Protection Grant Program:

For the CMP Year 20 cycle, the Air District had more than \$11 million available for eligible CMP and school bus projects from a combination of MSIF and CMP funds. The Air District started accepting project applications for the CMP Year 20 funding cycle on June 25, 2018 and applications are accepted and evaluated on a first-come, first-served basis. On December 20, 2017 the Board authorized the Air District to accept, obligate and expend \$50 million in AB 134 funds through the Community Health Protection Grant Program.

As of November 16, 2018, the Air District had received 124 project applications. Of the applications that have been evaluated between October 9, 2018 and November 16, 2018, 16

eligible projects have proposed individual grant awards over \$100,000. These projects will replace 13 pieces of agricultural equipment, three pieces of off-road equipment, 19 school buses, and 15 marine engines, and will reduce over 27.976 tons of NOx, ROG and PM per year. Staff recommends the allocation of \$13,270,776 for these projects from a combination of CMP funds, MSIF revenues and Community Health Protection Grant Program funds. Attachment 1, Table 1, provides additional information on these projects.

Attachment 2, lists all of the eligible projects that have been received by the Air District as of November 16, 2018, including information about the equipment category, award amounts, estimated emissions reductions, and county location. Approximately 62% of the funds have been awarded to projects that reduce emissions in highly impacted Bay Area communities. Attachment 4, Figures 4 and 5 summarize the cumulative allocation of CMP, MSIF, and Community Health Protection Grant Program funding since 2009 (more than \$246 million awarded to 1,099 projects).

Transportation Fund for Clean Air Program:

In FYE 2019, the Air District will be awarding \$20.44 million of TFCA monies to eligible projects. This includes \$13.36 million in new TFCA monies and \$7.08 million in carryover funds from previous cycles. As of November 16, 2018, the Air District had received 29 project applications. Of the applications that have been evaluated between October 9, 2018 and November 16, 2018, there were no eligible projects that proposed an individual grant award over \$100,000.

Attachment 3 lists all eligible TFCA projects that have been evaluated as of November 16, 2018 and three Air District-sponsored projects previously approved by the Board, including information about the equipment category, award amounts, estimated emissions reductions, and county location. Approximately 33% of FYE 2019 TFCA funds have been awarded to projects that reduce emissions in highly impacted Bay Area communities.

BUDGET CONSIDERATION / FINANCIAL IMPACT

None. The Air District distributes CMP, MSIF, Community Health Protection Grant Program, and TFCA funding to public agencies and private entities on a reimbursement basis. Funding for administrative costs is provided by each funding source.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Anthony Fournier and Ken Mak
Reviewed by: Karen Schkolnick and Chengfeng Wang

- Attachment 1: Projects with Grant Awards Greater than \$100,000
- Attachment 2: CMP/MSIF and Community Health Protection Grant Program Approved Projects
- Attachment 3: TFCA Program Approved Projects
- Attachment 4: Summary of Funding Awarded between 7/1/18 and 11/16/18

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

AGENDA 4 - ATTACHMENT 1

Table 1 - Carl Moyer Program/ Mobile Source Incentive Fund, and Community Health Protection Grant Program projects with grant awards greater than \$100k (Evaluated between 10/9/18 and 11/16/18)

Project #	Applicant name	Equipment category	Project description	Proposed contract award	Total project cost	Emission Reductions (Tons per year)			County
						NOx	ROG	PM	
20MOY49	F/V Rose Marie Inc.	Marine	Replacement of 1 diesel marine propulsion engine	\$ 148,000.00	\$ 185,636.00	0.597	-0.011	0.024	San Francisco
20MOY66	Pina Vineyard Management, LLC.	Ag/ off-road	Replacement of 3 diesel crawler tractors	\$ 188,700.00	\$ 235,958.00	0.160	0.037	0.028	Napa
20SBP08	Antioch Unified School District	School bus	Replacement of 3 diesel buses with electric buses and infrastructure	\$ 1,143,464.00	\$ 1,143,464.00	0.298	0.023	0.011	Contra Costa
20MOY76	FN Viticulture, LLC	Ag/ off-road	Replacement of 3 diesel tractors and 1 diesel loader	\$ 169,400.00	\$ 244,342.00	0.514	0.057	0.048	Napa
20MOY43	Michael Peery (Commercial fishing)	Marine	Replacement of 1 diesel marine propulsion engine and 1 diesel auxiliary engine	\$ 459,000.00	\$ 583,995.00	1.409	0.009	0.059	Solano
20MOY100	Grand Crew Vineyard Management	Ag/ off-road	Replacement of 2 diesel tractors and 1 diesel loader	\$ 136,520.00	\$ 170,667.00	0.211	0.077	0.033	Napa
20MOY67	Harley Marine Services, Inc. Vessel: Z-Three	Marine	Replacement of 2 diesel main engines and 2 diesel auxiliary engines	\$ 1,613,500.00	\$ 1,814,047.72	4.801	-0.135	0.380	Alameda
20MOY68	Harley Marine Services, Inc. Vessel: Z-Four	Marine	Replacement of 2 diesel main engines and 2 diesel auxiliary engines	\$ 1,613,500.00	\$ 1,858,826.12	4.801	-0.135	0.380	Alameda
20MOY69	Harley Marine Services, Inc. Vessel: Z-Five	Marine	Replacement of 2 diesel main engines and 2 diesel auxiliary engines	\$ 1,613,500.00	\$ 1,903,826.12	4.801	-0.135	0.380	Alameda
20MOY110	Steven's Creek Quarry, Inc.	Off-road	Replacement of 3 pieces of diesel off-road equipment	\$ 928,500.00	\$ 2,402,131.00	5.136	0.232	0.138	Santa Clara
20MOY117	Alameda-Contra Costa Transit District	On-road	Hydrogen fueling infrastructure	\$ 1,750,000.00	\$ 4,629,330.00	0.718	0.011	0.004	Alameda
20SBP1	Pittsburg Unified School District	School bus	Replacement of 2 diesel buses with electric buses	\$ 320,000.00	\$ 813,232.00	0.199	0.164	0.001	Contra Costa
20MOY95	Stan Poncia dba Terrilinda Dairy	Ag/ off-road	Replacement of 1 diesel loader	\$ 159,600.00	\$ 199,546.00	0.893	0.116	0.066	Sonoma
20MOY99	T and M Agricultural Services, LLC	Ag/ off-road	Replacement of 2 diesel tractors	\$ 121,800.00	\$ 152,340.00	0.359	0.047	0.032	Napa
20SBP72	Milpitas Unified School District	School bus	Replacement of 6 diesel buses with electric buses and infrastructure	\$ 1,246,785.00	\$ 2,476,853.37	0.318	0.019	0.007	Santa Clara
20SBP73	Berkeley Unified School District	School bus	Replacement of 5 diesel buses and 3 CNG buses with electric buses and infrastructure	\$ 1,659,507.00	\$ 3,419,509.06	0.617	0.045	0.132	Alameda
16 Projects				\$ 13,270,776.00	\$22,233,703.39	25.832	0.421	1.723	

AGENDA 4 - ATTACHMENT 2

*CMP/MSIF and Community Health Protection Grant Program approved projects
(between 7/6/18 and 11/16/18)*

Project #	Equipment category	Project type	# of engines	Proposed contract award	Applicant name	Emission Reductions (Tons per year)			Board approval date	County
						NOx	ROG	PM		
19MOY166	On-road	Equipment replacement	1	\$ 45,000.00	Deol Trans / Piara Singh	0.668	0.050	0.004	APCO	Contra Costa
19MOY168	Ag/ off-road	Equipment replacement	1	\$ 33,000.00	Rancho Las Juntas Vineyard	0.028	0.006	0.004	APCO	Contra Costa
19MOY163	Marine	Engine replacement	1	\$ 180,000.00	Bettencourt and Son (Commercial fishing)	0.647	0.009	0.021	10/17/2018	San Mateo
19MOY182	On-road	Equipment replacement	1	\$ 45,000.00	Thy Trucking	0.677	0.050	0.004	APCO	Alameda
19MOY185	On-road	Equipment replacement	1	\$ 60,000.00	Puerta Trucking	0.717	0.097	0.032	APCO	Merced
19MOY158	Ag/ off-road	Equipment replacement	1	\$ 117,000.00	Ocean Breeze Dairy	0.310	0.020	0.015	10/17/2018	Sonoma
19MOY159	Ag/ off-road	Equipment replacement	1	\$ 40,480.00	Trefethen Farming LLC	0.173	0.030	0.021	APCO	Napa
19MOY176	Ag/ off-road	Equipment replacement	1	\$ 60,000.00	Bazan Vineyard Management	0.198	0.033	0.025	APCO	Napa
19SBP12	School bus	Equipment replacement	4	\$ 512,170.00	Moreland School District	0.237	0.016	0.000	10/17/2018	Santa Clara
19MOY148	Off-road	Equipment replacement	2	\$ 197,278.00	The Lumber Baron, Inc.	0.178	0.044	0.008	10/17/2018	Alameda
19SBP97	School bus	Equipment replacement	8	\$ 1,635,693.00	Vallejo City Unified School District	0.826	0.065	0.000	10/17/2018	Solano
19MOY175	Off-road	Equipment replacement	1	\$ 75,680.00	Mt. Diablo Landscape Centers, LLC	0.189	0.031	0.023	APCO	Contra Costa
20MOY51	Ag/ off-road	Equipment replacement	5	\$ 467,856.00	Johnson and Neles Dairy	1.985	0.208	0.124	10/17/2018	Sonoma
20MOY52	On-road	Equipment replacement	1	\$ 60,000.00	James Marlowe Carson	0.904	0.068	0.005	APCO	Napa
19MOY181	Ag/ off-road	Equipment replacement	1	\$ 50,300.00	Jensen Ranch	0.122	0.019	0.011	APCO	Marin
19SBP140	School bus	Equipment replacement	18	\$ 4,076,369.00	Fremont Unified School District	1.717	0.139	0.034	10/17/2018	Alameda

AGENDA 4 - ATTACHMENT 2

Project #	Equipment category	Project type	# of engines	Proposed contract award	Applicant name	Emission Reductions (Tons per year)			Board approval date	County
						NOx	ROG	PM		
20SBP45	School bus	Equipment replacement	2	\$ 1,291,000.00	Campbell Union School District	0.104	0.006	0.000	10/17/2018	Santa Clara
19MOY180	On-road	Equipment replacement	26	\$ 492,100.00	Nestle Waters North America	1.061	0.046	0.003	11/7/2018	Alameda, Solano
20MOY36	On-road	Equipment replacement	1	\$ 60,000.00	ZQR Trucking	0.982	0.074	0.006	APCO	Alameda
20MOY48	Marine	Engine replacement	1	\$ 99,500.00	Michael Thomas Hudson (Commercial fishing)	0.257	0.006	0.010	APCO	Alameda
20MOY60	Ag/ off-road	Equipment replacement	1	\$ 46,355.00	Siqueira Vineyard Management	0.156	0.026	0.018	APCO	Napa
20MOY50	Marine	Engine replacement	2	\$ 159,000.00	Captain Joe's Sportfishing	0.367	0.009	0.017	11/7/2018	San Francisco
20MOY71	Ag/ off-road	Equipment replacement	6	\$ 258,796.00	Pina Management Services	0.865	0.124	0.084	11/7/2018	Sonoma
20MOY65	On-road	Equipment replacement	1	\$ 40,000.00	Zahniser Trucking	0.738	0.122	0.006	APCO	Contra Costa
20MOY29	Off-road	Equipment replacement	3	\$ 15,000.00	D. C. Metals, Inc.	0.126	0.034	0.001	APCO	Alameda
20MOY62	Ag/ off-road	Equipment replacement	1	\$ 60,190.00	Vezer Family Vineyards	0.048	0.012	0.010	APCO	Solano
20MOY46	On-road	Equipment replacement	1	\$ 49,000.00	Akal Sahai Truck Lines Inc.	1.446	0.217	0.000	APCO	Alameda
20MOY63	On-road	Equipment replacement	1	\$ 23,500.00	Always Express Transportation	0.179	0.011	0.001	APCO	Alameda
20MOY49	Marine	Engine replacement	1	\$ 148,000.00	F/V Rose Marie Inc.	0.597	-0.011	0.024	TBD	San Francisco
20MOY94	Marine	Engine replacement	1	\$ 44,000.00	Jeffrey A Sylva (Commercial fishing)	0.116	0.001	0.004	APCO	Santa Clara
20MOY41	Ag/ off-road	Equipment replacement	1	\$ 29,500.00	Kehoe Dairy, Inc	0.049	0.002	0.003	APCO	Marin
20MOY66	Ag/ off-road	Equipment replacement	3	\$ 188,700.00	Pina Vineyard Management, LLC.	0.160	0.037	0.028	TBD	Napa
20MOY64	On-road	Equipment replacement	1	\$ 60,000.00	Basra Trucking	1.570	0.239	0.083	APCO	Santa Clara

AGENDA 4 - ATTACHMENT 2

Project #	Equipment category	Project type	# of engines	Proposed contract award	Applicant name	Emission Reductions (Tons per year)			Board approval date	County
						NOx	ROG	PM		
20SBP08	School bus	Equipment replacement	3	\$ 1,143,464.00	Antioch Unified School District	0.298	0.023	0.011	TBD	Contra Costa
20MOY76	Ag/ off-road	Equipment replacement	4	\$ 169,400.00	FN Viticulture, LLC	0.514	0.057	0.048	TBD	Napa
20MOY97	On-road	Equipment replacement	1	\$ 40,000.00	Gosal Trucking	0.835	0.138	0.047	APCO	Contra Costa
20MOY43	Marine	Engine replacement	2	\$ 458,000.00	Michael Peery (Commercial fishing)	1.409	0.009	0.059	TBD	Solano
20MOY100	Ag/ off-road	Equipment replacement	3	\$ 136,520.00	Grand Crew Vineyard Management	0.211	0.077	0.033	TBD	Napa
20MOY96	On-road	Equipment replacement	1	\$ 60,000.00	Reliable Express Transportation Inc.	0.586	0.043	0.003	APCO	Alameda
20MOY67	Marine	Engine replacement	4	\$ 1,613,500.00	Harley Marine Services, Inc. Vessel: Z-Three	4.801	-0.135	0.380	TBD	Alameda
20MOY68	Marine	Engine replacement	4	\$ 1,613,500.00	Harley Marine Services, Inc. Vessel: Z-Four	4.801	-0.135	0.380	TBD	Alameda
20MOY69	Marine	Engine replacement	4	\$ 1,613,500.00	Harley Marine Services, Inc. Vessel: Z-Five	4.801	-0.135	0.380	TBD	Alameda
20MOY110	Off-road	Equipment replacement	3	\$ 928,500.00	Steven's Creek Quarry, Inc.	5.136	0.232	0.138	TBD	Santa Clara
20MOY117	On-road	Hydrogen fueling infrastructure	1	\$ 1,750,000.00	Alameda-Contra Costa Transit District	0.718	0.011	0.004	TBD	Alameda
20SBP1	School bus	Equipment replacement	2	\$ 320,000.00	Pittsburg Unified School District	0.199	0.164	0.001	TBD	Contra Costa
20MOY95	Ag/ off-road	Equipment replacement	1	\$ 159,600.00	Stan Poncia dba Terrilinda Dairy	0.893	0.116	0.066	TBD	Sonoma
20MOY99	Ag/ off-road	Equipment replacement	2	\$ 121,800.00	T and M Agricultural Services, LLC	0.359	0.047	0.032	TBD	Napa
20SBP72	School bus	Equipment replacement	6	\$ 1,246,785.00	Milpitas Unified School District	0.318	0.019	0.007	TBD	Santa Clara
20SBP73	School bus	Equipment replacement	8	\$ 1,659,507.00	Berkeley Unified School District	0.617	0.045	0.132	TBD	Alameda
49 Projects			150	\$ 23,755,473.00		44.892	2.419	2.350		

AGENDA 4 - ATTACHMENT 3

Summary of all TFCA approved and eligible projects (evaluated between 7/1/18 and 11/16/18)

Project #	Project Category	Project Description	Award Amount	Applicant Name	Emission Reductions (Tons per year)			Board Approval Date	CARE Area	County
					NO _x	ROG	PM			
18EV049	LD Infrastructure	Install and operate 12 single-port Level 2 (high) charging stations at 6 destination facilities in San Mateo, Burlingame, San Bruno, and Millbrae	\$36,000	San Mateo Union High School District	0.020	0.025	0.000	7/5/18	No	San Mateo
18EV056	LD Infrastructure	Install and operate 3 dual-port Level 2 (high) charging stations at 3 destination facilities in Richmond and El Cerrito	\$12,000	West Contra Costa Unified School District	0.007	0.009	0.000	7/5/18	Yes	Contra Costa
18EV047	LD Infrastructure	Install and operate 4 single port Level 2 (high) charging stations at 1 destination facility in San Mateo	\$12,000	Nazareth Plaza Owners' Association	0.007	0.009	0.000	7/30/18	No	San Mateo
18EV035	LD Infrastructure	Install and operate 4 single-port Level 2 (high) charging stations at 1 destination facility in Greenbrae	\$12,000	Marin Rowing Association	0.007	0.009	0.000	7/31/18	No	Marin
18EV029	LD Infrastructure	Install and operate 16 single-port Level 2 (high) charging stations at 1 workplace facility in Los Altos Hills	\$48,000	Creative Center of Los Altos	0.026	0.034	0.000	10/30/18	No	Santa Clara
18R18	Bicycle Facilities	Install 0.09 miles of Class I and 0.28 miles of Class IV bikeways in Los Gatos	\$242,000	Town of Los Gatos	0.029	0.055	0.039	8/1/18	No	Santa Clara
18R21	Bicycle Facilities	Install 40 electronic bicycle lockers in Danville	\$96,000	Town of Danville	0.014	0.018	0.026	8/3/18	No	Contra Costa
18R22	Bicycle Facilities	Install 16 electronic bicycle lockers in San Francisco	\$32,000	San Francisco Community College District	0.004	0.006	0.007	8/3/18	No	San Francisco
18R14	Bicycle Facilities	Install + maintain 3.62 miles of Class III bikeways in Petaluma	\$48,500	City of Petaluma	0.007	0.009	0.014	8/6/18	No	Sonoma
18R20	Bicycle Facilities	Install and maintain 1.57 miles of Class II bikeways and 23 bike racks (2 bikes per rack)	\$38,000	City of Gilroy	0.008	0.010	0.013	8/22/18	No	Santa Clara
19R01	Trip Reduction	Enhanced Mobile Source & Commuter Benefits Enforcement	\$554,842	BAAQMD	NA	NA	NA	NA	No	Regional
19R02	LD Vehicles	Vehicle Buy Back Program	\$150,000	BAAQMD	NA	NA	NA	NA	No	Regional
19R03	Trip Reduction	Spare The Air/Intermittent Control Programs	\$2,305,927	BAAQMD	NA	NA	NA	NA	No	Regional
19RFG04*	Off-road (non-ag)	Purchase 5 electric forklifts, 1 electric vacuum unit, and 1 electric terminal truck	\$221,000	Wyse Logistics	0.107	0.015	0.008	10/17/18	Yes	Alameda
19RFG06*	LD Infrastructure	Install 45 dual port level 2 EV charging stations	\$279,000	Hayward Unified School District	0.014	0.003	0.001	10/17/18	Yes	Alameda
19RFG09*	LD Vehicles	Deploy 48 EVs in carsharing service	\$439,000	Envoy Technologies	0.027	0.005	0.002	10/17/18	Yes	Alameda / Contra Costa
19R10	Trip Reduction	Pleasanton Connector Shuttles	\$80,000	San Joaquin Regional Rail Commission	0.234	0.387	0.647	10/18/18	Yes	Alameda
19R13	Trip Reduction	Juvenile Justice Center/ Fairmont Hospital Shuttle	\$29,700	County of Alameda	0.011	0.040	0.058	10/18/18	Yes	Alameda
19R14	Trip Reduction	PresidioGO Downtown Shuttle	\$100,000	Presidio Trust	0.252	0.352	0.471	11/7/2018	Yes	San Francisco
19R15	Trip Reduction	Caltrain Shuttle Program	\$652,600	Peninsula Corridor Joint Powers Board	2.64	3.66	5.14	11/7/2018	No	San Mateo/Santa Clara
19R16	Trip Reduction	ACE Shuttle Bus Program	\$960,000	Santa Clara Valley Transportation Authority	2.43	2.60	4.29	11/7/2018	Yes	Santa Clara
19R18	Trip Reduction	SJSU Ridesharing & Trip Reduction	\$139,500	Associated Students, San Jose State University	0.231	0.266	0.366	11/7/2018	No	Regional

22 Projects*

\$6,488,069

6.073 7.512 11.084

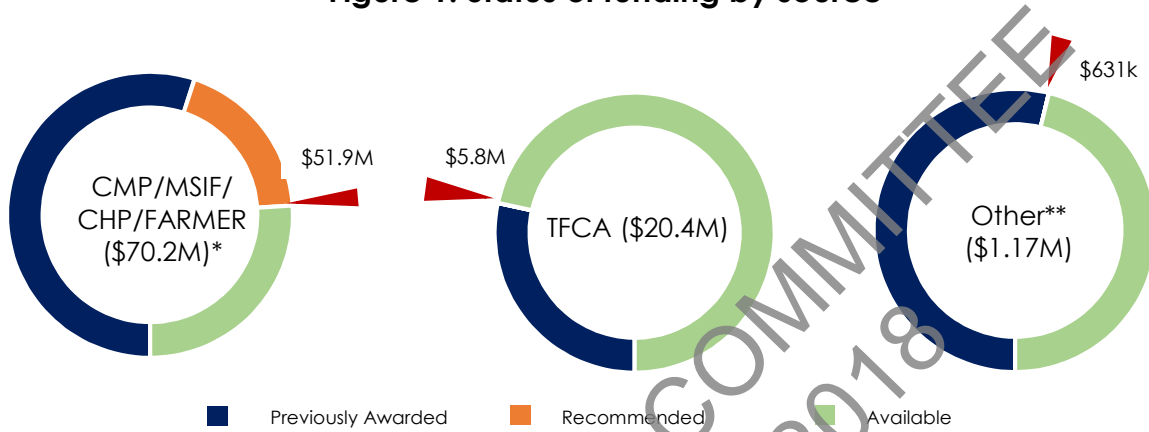
* The award amounts for these projects include a total of \$631,000 of RFG funds

AGENDA 4 - ATTACHMENT 4

Summary of funding awarded between 7/1/18 and 11/16/18

- Carl Moyer Program (CMP)
- Community Health Protection Program (CHP)
- Funding Agricultural Replacement Measures for Emission Reductions (FARMER)
- Mobile Source Incentive Fund (MSIF)
- Transportation Fund for Clean Air (TFCA)
- Reformulated Gasoline Settlement Fund (RFG)

Figure 1. Status of funding by source



* Includes awards from FYE 2018
 ** Other includes RFG

Figure 2. Funding awarded by county

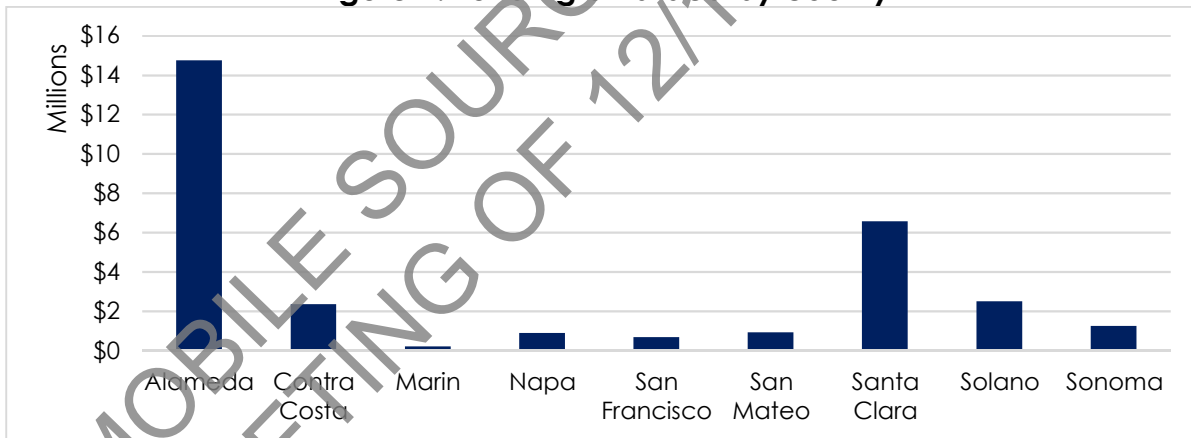
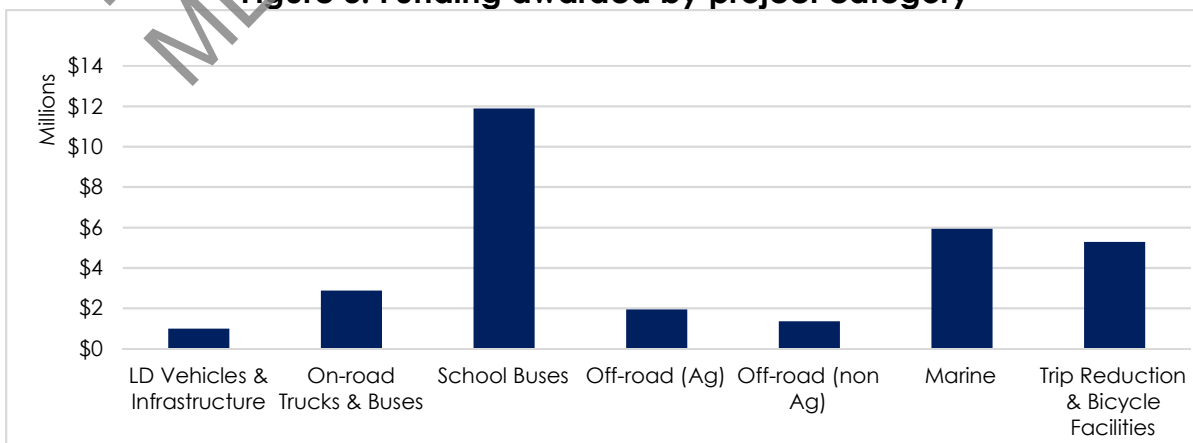


Figure 3. Funding awarded by project category



AGENDA 4 - ATTACHMENT 4

Figure 4. CMP/MSIF/CHP/FARMER funding awarded since 2009 by county

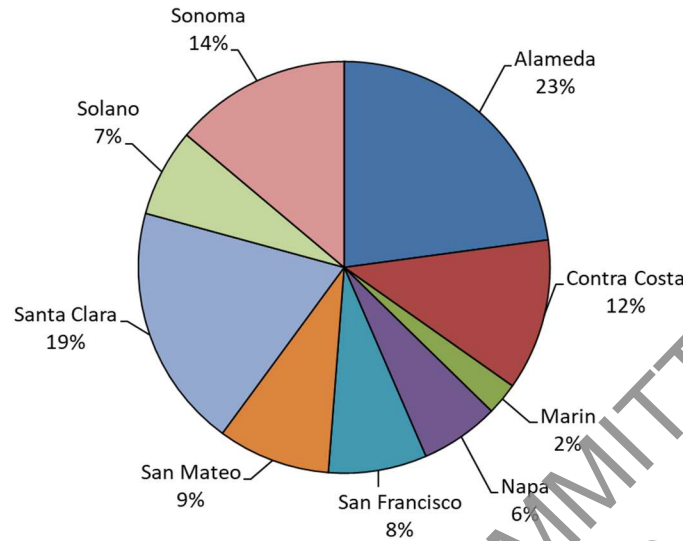
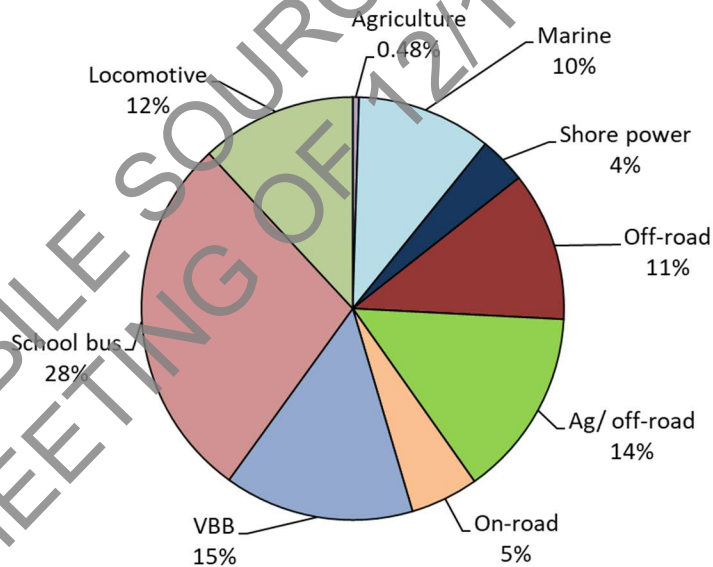


Figure 5. CMP/MSIF/CHP/FARMER funding awarded since 2009 by category



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson Scott Haggerty and Members
of the Mobile Source Committee

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 4, 2018

Re: Fiscal Year Ending (FYE) 2017 Transportation Fund for Clean Air (TFCA) Program
Audit Results

RECOMMENDED ACTION

None; receive and file.

BACKGROUND

In 1991, the California State Legislature authorized the Bay Area Air Quality Management District (Air District) to impose a \$4 surcharge on motor vehicles registered within the nine-county Bay Area to fund projects that reduce on-road motor vehicle emissions. Since 1992, the Air District has allocated these funds to its Transportation Fund for Clean Air (TFCA) Program to fund eligible projects and programs. The statutory authority for the TFCA and requirements of the program are set forth in California Health and Safety Code (HSC) Sections 44241 and 44242.

Sixty percent of TFCA funds are awarded by the Air District to eligible projects and programs implemented directly by the Air District (e.g., Spare the Air) and through a grant program known as the Regional Fund. The remaining 40% of TFCA funds are forwarded to the designated agency within each Bay Area county to be distributed via the County Program Manager Fund.

HSC Section 44242 requires that the Air District conduct an audit of projects and programs funded with TFCA monies, at least once every two years. The Air District audits Regional Fund projects and Air District-Sponsored programs annually and County Program Manager Fund projects biennially. On October 4, 2017, the Air District's Board of Directors (Board) approved the award of a contract to Simpson & Simpson, LLP for audit services, including a financial and compliance review of TFCA-funded projects and programs.

DISCUSSION

Fiscal Year Ending (FYE) 2017 TFCA Audit (Audit #19) covers Regional Fund projects, Air District-sponsored programs, and County Program Manager Fund projects that were completed between July 1, 2016 and June 30, 2017. Simpson & Simpson, LLP conducted financial and compliance audits of 26 Regional Fund projects, three Air District-Sponsored programs, and 119 County Program Manager Fund projects. Audit # 19 also reviewed the Air District administrative

expense of TFCA funds incurred between July 1, 2016 and June 30, 2017.

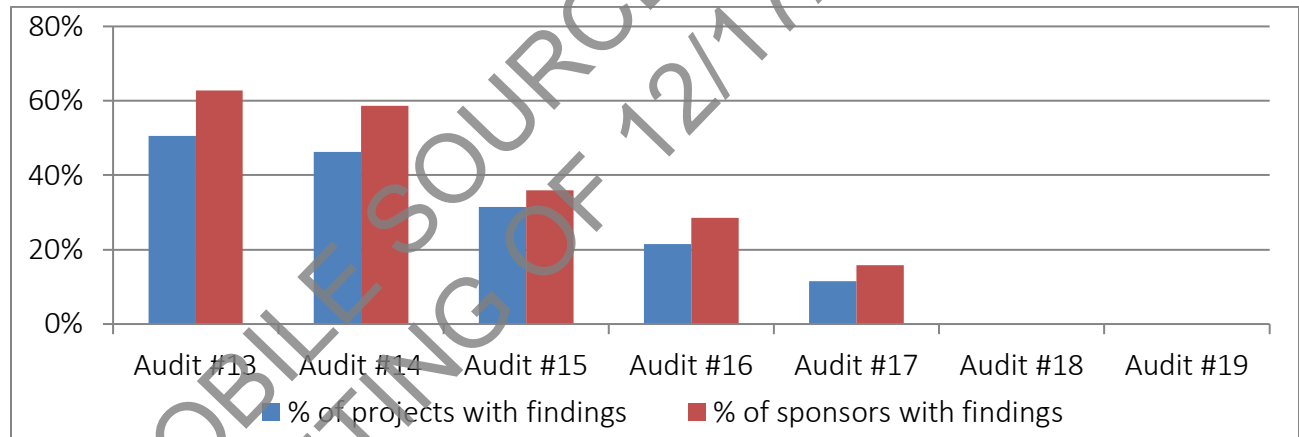
For Audit #19, Simpson & Simpson, LLP conducted audit field work during the months of February 2018 through October 2018. Following the completion of field-work, Simpson & Simpson, LLP issued a draft audit report to each of the project sponsors and County Program Managers and offered an opportunity to those with any preliminary findings to provide a management response.

Results for TFCA Regional Fund Projects and Air District-Sponsored Programs

The Audit Summary Report for the TFCA Regional Fund Projects and Air District-Sponsored Programs is included as Attachment 1. Appendix B of this report contains a list of the projects and programs that were audited. There were no reported findings.

The lack of findings in Regional Fund projects reflects an overall improvement in project sponsors' adherence to program and contractual requirements and is the result of actions taken by Air District staff over the years to improve and strengthen its administrative processes and to provide additional support to project sponsors. Figure 1 below shows the performance trend of the most recent seven TFCA audits.

Figure 1: Performance Trend for TFCA Regional Fund and Air District-Sponsored Programs Audits #13 - #19



Results for TFCA County Program Manager Fund

The Audit Summary Report for the County Program Manager Fund is included as Attachment 2. Appendix B of this report contains a list of the projects and programs that were audited. There were two findings for the TFCA County Program Manager Fund:

- The Transportation Authority of Marin (TAM) over-reported the amount of TFCA funds expended for project #10MAR07. Upon the auditor's review, a total of \$103,128 in TFCA funds was expended on this project; however, on the Final Report submitted to the Air District in May 2017, TAM reported that \$142,000 was expended. As the \$38,872 overreported amount was properly credited and accounted in TAM's TFCA fund as of June

30, 2013, this is a reporting discrepancy that was caused by limited access to historic data hosted in Marin County's discontinued SAP Financial system. Based on TAM's response, the implementation of its MIP Financial system will prevent the same issue from happening again and the overreported funds will be re-programmed to other eligible TFCA projects.

- The City/County Association of Governments of San Mateo County was late in submitting the Final Reports for projects #16SM01 and #16SM02. These reports were due on October 31, 2016 but were not submitted until November 18, 2016.

Air District staff will continue to work closely with the County Program Managers to improve and strengthen administrative processes and will also be updating the next funding agreement boilerplate to allow the Air District to accept a late-submitted report at its discretion without waiving or amending the submission deadline of any or all subsequent reports.

A discussion of the audit process, results, and the steps that Air District staff has taken to ensure continued compliance with program requirements will be presented at the Committee meeting.

BUDGET CONSIDERATION / FINANCIAL IMPACT

None. Administrative costs for the TFCA audit and staff are provided by the funding source.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Sean Newlin, Linda Hui and Ken Mak
Reviewed by: Karen Senkolnick and Chengfeng Wang

Attachment 1: FYE 2017 Audit Summary Report for the TFCA Regional Fund (Audit #19)
Attachment 2: FYE 2017 Audit Summary Report for the TFCA County Program Manager Fund (Audit #19)

12/17/2018 MOBILE SOURCE COMMITTEE MEETING

AGENDA ITEM #5 – ATTACHMENT 1

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

**TRANSPORTATION FUND FOR CLEAN AIR
PROGRAM REGIONAL FUND**

AUDIT SUMMARY REPORT

PROJECT PERIOD ENDED JUNE 30, 2017

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND**

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MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

1 – INTRODUCTION

The Bay Area Air Quality Management District (Air District) was created by the California legislature in 1955. The Air District's structure, operating procedures and authority are established by Division 26 of the California Health and Safety Code.

The Air District includes seven counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo and Santa Clara and portions of two other counties, Southwestern Solano and Southern Sonoma. The Air District is governed by a twenty-two-member Board of Directors that includes representatives from all of the above counties.

The Air District's jurisdiction is limited principally to policing non-vehicular sources of air pollution within the Bay Area, primarily industry pollution and burning. Any company wishing to build or modify a facility in the Bay area must first obtain a permit from the Air District to ensure that the facility complies with all applicable rules.

The Air District also acts as the program administrator for Transportation Fund for Clean Air (TFCA) funds and Mobile Source Incentive funds (MSIF) derived from Assembly Bill 434 and Assembly Bill 923 respectively. TFCA and MSIF funding comes from a \$4 and \$2 surcharge, respectively, on motor vehicles registered within the Air District. TFCA funding may only be used to fund eligible projects that reduce motor vehicle emissions and support the implementation of the transportation and mobile source control measures in the Clean Air Plan in place at time of award. All projects must fall within the categories listed in State Law (Health and Safety Code Section 44241).

The Health and Safety Code requires the Air District to pass-through no less than 40% of the TFCA revenues raised within a particular county, after audit and administrative costs, to that county's designated Program Manager. The remaining 60% is for Regional Fund grants and is being allocated to projects on a competitive basis. Projects are evaluated using the Air District's Board adopted evaluation and scoring criteria.

2 – PROGRAM DESCRIPTION

Health and Safety Code Section 44223 and 44225 authorize a surcharge on the motor vehicle registration fee (surcharge) to be used by the Bay Area Air Quality Management District (Air District) and local governments specifically for programs to reduce air pollution from motor vehicles. The Department of Motor Vehicles collects the surcharge and allocates the amounts to the Air District. The Air District administers these funds through the Transportation Fund for Clean Air (TFCA) Program. Under the TFCA Program, money is allocated to two funds: (1) 60% is placed in the Regional Fund and allocated to agencies on a competitive basis by the Air District and (2) 40% is placed in the Program Manager Fund and allocated to designated agencies. Allowable projects under Health and Safety Code Section 44241 include the following:

- The implementation of ridesharing programs.
- The purchase or lease of clean fuel buses for school districts and transit operators.
- The provision of local feeder bus or shuttle service to rail and ferry stations and to airports.
- Implementation and maintenance of local arterial traffic management, including, but not limited to, signal timing, transit signal preemption, bus stop relocation and "smart streets."

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

2 – PROGRAM DESCRIPTION (continued)

- Implementation of rail-bus integration and regional transit information systems.
- Implementation of demonstration projects in telecommuting and in congestion pricing of highways, bridges, and public transit.
- Implementation of vehicle-based projects to reduce mobile source emissions, including, but not limited to, engine repowers, engine retrofits, fleet modernization, alternative fuels, and advanced technology demonstrations.
- Implementation of a smoking vehicles program.
- Implementation of an automobile buy-back scrappage program operated by a governmental agency.
- Implementation of bicycle facility improvement projects that are included in an adopted countywide bicycle plan or congestion management program.
- The design and construction by local public agencies of physical improvements that support development projects that achieve motor vehicle emission reductions. The projects and the physical improvements shall be identified in an approved area-specific plan, redevelopment plan, general plan, or other similar plan.

State law requires that any agency receiving TFCA funding be subject to an audit, at least once every two years. Health and Safety Code Section 44242 provides the legal compliance guidelines for the Air District to follow in the event revenues are not spent appropriately or when projects do not result in emission reductions. Health and Safety Code Sections 44241 and 44242 are provided in Appendix A.

The Air District retained the firm of Simpson and Simpson LLP to conduct financial and compliance audits of completed projects funded through the Regional Fund for the project period ended June 30, 2017. These audits were conducted during the months of May 2018 through November 2018.

A total of 25 individual project sponsors and 30 projects were audited, with \$9,314,563 total funds expended through June 30, 2017. A listing of the projects audited is provided in Appendix B. Unmodified opinions were issued on all 25 reports.

3 – AUDIT PROCESS

The audits were designed to address numerous financial and compliance objectives; however, the principal objectives of the audits were to (1) provide assurance that amounts reported in the Schedules of Expenditures are fairly stated, and (2) determine whether projects financed through the Air District's Regional Fund met funding agreement requirements. The audit procedures were specifically designed for TFCA financial and compliance requirements, which is described below:

Audit of the Schedules of Expenditures

The financial audits were conducted in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States for the project period ended June 30, 2017.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

3 – AUDIT PROCESS (continued)

Procedures performed included, but were not limited to:

- Gaining an understanding of the project sponsors' internal controls over financial reporting of the TFCA program through observation, inquiry, and supporting documentation.
- Tracing expenditures related to the TFCA program to the project sponsor's accounting records.
- Validating TFCA expenditures related to vendor disbursements, payroll, and administrative charges to supporting documentation.
- Conducting interviews with project sponsors to inquire about known, alleged or suspected fraud related to the program.

Compliance Auditing Procedures

The audits were performed in accordance with the requirements outlined in the Health and Safety Code, individual funding agreements and Government Auditing Standards. The principal focus of the compliance auditing procedures was to ensure TFCA expenditures were paid in accordance with the program's objectives (Health and Safety Code Section (HSC) 44241). Compliance audits were planned and performed to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to in the HSC could have a direct and material effect on projects reported in the Schedules occurred.

The audit includes examining, on a test basis, evidence about the project sponsor's compliance with those requirements and performing such other procedures as considered necessary in the circumstances, as of the project period ended June 30, 2017.

Auditing procedures performed included, but were not limited to:

- Testing expenditures for allowable costs in accordance with Section 44241 of the Health and Safety Code.
- Verifying that the project sponsor used the TFCA funds for the reduction of emissions from motor vehicles.
- Determining that the project sponsor adopted appropriate resolutions authorizing the grant application or, where applicable, an authorizing letter of commitment.
- Verifying the expenditure of funds was within two years, unless a longer period was approved in writing by the Air District.
- Determining whether the project sponsor submitted to the Air District all required reports and that the reports contained all information required as specified on Attachment C of the funding agreement.
- Verifying the use of the Air District's approved logo or acknowledgment of the Air District in printed or electronic materials for public distribution.
- Determining whether other specific terms of the funding agreement were adhered to, such as additional reporting requirements.

4 – PROJECT SPONSOR FINDINGS

No project sponsor findings were identified for the project period ending June 30, 2017.

APPENDIX A

HEALTH AND SAFETY CODE SECTIONS 44241 AND 44242

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Appendix A - Health and Safety Code Sections 44241 and 44242
For the Project Period Ended June 30, 2017**

44241

- (a) Fee revenues generated under this chapter in the bay district shall be subvned to the bay district by the Department of Motor Vehicles after deducting its administrative costs pursuant to Section 44229.
- (b) Fee revenues generated under this chapter shall be allocated by the bay district to implement the following mobile source and transportation control projects and programs that are included in the plan adopted pursuant to Sections 40233, 40717, and 40919:
- (1) The implementation of ridesharing programs.
 - (2) The purchase or lease of clean fuel buses for school districts and transit operators.
 - (3) The provision of local feeder bus or shuttle service to rail and ferry stations and to airports.
 - (4) Implementation and maintenance of local arterial traffic management, including, but not limited to, signal timing, transit signal preemption, bus stop relocation and "smart streets."
 - (5) Implementation of rail-bus integration and regional transit information systems.
 - (6) Implementation of demonstration projects in telecommuting and in congestion pricing of highways, bridges, and public transit. No funds expended pursuant to this paragraph for telecommuting projects shall be used for the purchase of personal computing equipment for an individual's home use.
 - (7) Implementation of vehicle-based projects to reduce mobile source emissions, including, but not limited to, engine repowers, engine retrofits, fleet modernization, alternative fuels, and advanced technology demonstrations.
 - (8) Implementation of a smoking vehicles program.
 - (9) Implementation of an automobile buy-back scrappage program operated by a governmental agency.
 - (10) Implementation of bicycle facility improvement projects that are included in an adopted countywide bicycle plan or congestion management program.
 - (11) The design and construction by local public agencies of physical improvements that support development projects that achieve motor vehicle emission reductions. The projects and the physical improvements shall be identified in an approved area-specific plan, redevelopment plan, general plan, or other similar plan.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Appendix A - Health and Safety Code Sections 44241 and 44242
For the Project Period Ended June 30, 2017**

44241 (continued)

- (c) (1) Fee revenue generated under this chapter shall be allocated by the bay district for projects and programs specified in subdivision (b) to cities, counties, the Metropolitan Transportation Commission, transit districts, or any other public agency responsible for implementing one or more of the specified projects or programs. Fee revenue generated under this chapter may also be allocated by the bay district for projects and programs specified in paragraph (7) of subdivision (b) to entities that include, but are not limited to, public agencies, consistent with applicable policies adopted by the governing board of the bay district. Those policies shall include, but are not limited to, requirements for cost-sharing for projects subject to the policies. Fee revenues shall not be used for any planning activities that are not directly related to the implementation of a specific project or program.
- (2) The bay district shall adopt cost-effectiveness criteria for fee revenue generated under this chapter that projects and programs are required to meet. The cost-effectiveness criteria shall maximize emissions reductions and public health benefits.
- (d) Not less than 40 percent of fee revenues shall be allocated to the entity or entities designated pursuant to subdivision (e) for projects and programs in each county within the bay district based upon the county's proportionate share of fee-paid vehicle registration.
- (e) In each county, one or more entities may be designated as the overall program manager for the county by resolutions adopted by the county board of supervisors and the city councils of a majority of the cities representing a majority of the population in the incorporated area of the county. The resolution shall specify the terms and conditions for the expenditure of funds. The entities so designated shall be allocated the funds pursuant to subdivision (d) in accordance with the terms and conditions of the resolution.
- (f) Any county, or entity designated pursuant to subdivision (e), that receives funds pursuant to this section, at least once a year, shall hold one or more public meetings for the purpose of adopting criteria for expenditure of the funds, if those criteria have been modified in any way from the previous year. Any county, or entity designated pursuant to subdivision (e), that receives funds pursuant to this section, at least once a year, shall also hold one or more public meetings to review the expenditure of revenues received pursuant to this section by any designated entity. If any county or entity designated pursuant to subdivision (e) that receives funds pursuant to this section has not allocated all of those funds within six months of the date of the formal approval of its expenditure plan by the bay district, the bay district shall allocate the unallocated funds in accordance with subdivision (c).

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Appendix A - Health and Safety Code Sections 44241 and 44242
For the Project Period Ended June 30, 2017**

44242

- (a) Any agency which receives funds pursuant to Section 44241 shall, at least once every two years, undertake an audit of each program or project funded. The audit shall be conducted by an independent auditor selected by the bay district in accordance with Division 2 (commencing with Section 1100) of the Public Contract Code. The district shall deduct any audit costs which will be incurred pursuant to this section prior to distributing fee revenues to cities, counties, or other agencies pursuant to Section 44241.
- (b) Upon completion of an audit conducted pursuant to subdivision (a), the bay district shall do both of the following:
- (1) Make the audit available to the public and to the affected agency upon request.
 - (2) Review the audit to determine if the fee revenues received by the agency were spent for the reduction of air pollution from motor vehicles pursuant to the plan prepared pursuant to Sections 40233 and 40717.
- (c) If, after reviewing the audit, the bay district determines that the revenues from the fees may have been expended in a manner which is contrary to this chapter or which will not result in the reduction of air pollution from motor vehicles pursuant to that plan, the district shall do all of the following:
- (1) Notify the agency of its determination.
 - (2) Within 45 days of the notification pursuant to paragraph (1), hold a public hearing at which the agency may present information relating to expenditure of the revenues from the fees.
 - (3) After the public hearing, if the district determines that the agency has expended the revenues from the fees in a manner which is contrary to this chapter or which will not result in the reduction of air pollution from motor vehicles pursuant to the plan prepared pursuant to Sections 40233 and 40717, the district shall withhold these revenues from the agency in an amount equal to the amount which was inappropriately expended. Any revenues withheld pursuant to this paragraph shall be redistributed to the other cities within the county, or to the county, to the extent the district determines that they have complied with the requirements of this chapter.
- (d) Any agency which receives funds pursuant to Section 44241 shall encumber and expend the funds within two years of receiving the funds, unless an application for funds pursuant to this chapter states that the project will take a longer period of time to implement and is approved by the district or the agency designated pursuant to subdivision (e) of Section 44241. In any other case, the district or agency may extend the time beyond two years, if the recipient of the funds applies for that extension and the district or agency, as the case may be, finds that significant progress has been made on the project for which the funds were granted.

APPENDIX B

LISTING OF AUDITED PROJECTS

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

TFCAs Project Number	Project Sponsor	Project Description	Final Project Expenses through 6/30/2017
17R00	BAAQMD	Administration	\$ 1,284,608
17R01	BAAQMD	Enhanced Mobile Source	
17R02	BAAQMD	Inspections	488,124
17R03	BAAQMD	Vehicle Buy Back Program	119,761
15R18	BAAQMD	Space the Air/Intermittent Control Programs	1,658,955
16RFG18	San Francisco Bay Area Rapid Transit District	Electronic Bicycle Lockers and Racks Program	268,095
16EV019	San Francisco Bay Area Rapid Transit District	Install 18 dual port and 5 single port level 2 charging stations in Fremont	250,000
16EV001	California State University, East Bay	Install 2 dual-port level 2 charging stations in Hayward	12,000
16RFG01	Car Charging Inc.	Install 10 single port level 2 charging stations within San Jose	28,885
16RFG08	Chabot-Las Positas Community College District	Install 12 dual port level 2 charging stations in Livermore and Hayward	65,112
16RFG15	City of Millbrae	Install 8 dual-port level 2 charging stations in Millbrae	78,000
16RFG17	City of Palo Alto	Install 1 dual-port and 1 single-port level 2 charging stations in Palo Alto	20,000
16DCFC01	City of Richmond	Install 1 DC fast and 1 single-port level 2 charging stations in Richmond	47,511
16EV002	City of Saratoga	Install 1 dual-connector DC Fast Charger station in Saratoga	35,000
16EV023	DTTC Properties, Inc.	Install 3 single-port level 2 charging stations with solar in Campbell	22,500
15R27	Ferrotec Corporation	Install two dual-port level 2 charging stations in Livermore	8,228
16EV021	FirstElement Fuel Inc.	Install 7 hydrogen refueling stations in Saratoga, Mill Valley, San Jose, Campbell, Hayward, South San Francisco, and Fremont	873,918
15R31	Ford Point, LLC	Install 1 DC fast and 8 dual-port level 2 charging stations in Richmond	73,000
	Hydrogen Technology & Energy Corporation	Install one hydrogen refueling station in Woodside	145,000

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM REGIONAL FUND
Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

TFCA Project Number	Project Sponsor	Project Description	Final Project Expenses through 6/30/2017
16EV049	One Hawthorne Owners Association	Install 4 level 2 charging stations in San Francisco	10,319
15R05	Metropolitan Transportation Commission	Regional Rideshare Program	830,962
16R11	Metropolitan Transportation Commission	Regional Carpool Program	918,750
16RFG11	NASA Ames Exchange Peninsula Corridor Joint Power Board	Install 8 DC fast charging stations in Moffett Field	342,014
16R19		Caltrain Shuttle Program	188,425
16R17	Presidio Trust	PresidiGO Downtown Shuttle	100,000
16R15	San Joaquin Regional Rail Commission	ACE Shuttle 53 & 54	77,813
16EV012	Santa Clara Campus Owners' Association	Install 98 dual-port level 2 charging stations in Santa Clara	338,546
16R20	Santa Clara Valley Transportation Authority	ACE Shuttle Bus Program	960,000
14R19	San Francisco Bay Area Water Emergency Transportation Authority	Electronic Bicycle Lockers	45,037
16EV044	Siemens Healthcare Diagnostics, Inc.	Install 4 single-port level 2 charging stations in Berkeley	10,000
16EV040	Sonoma State University	Install 2 dual-port level 2 and 2 single-port level 2 charging stations in Rohnert Park	14,000
Final Project Expenses through 6/30/2017			<u>S 9,314,563</u>
Total Project Sponsors Audited			25
Total Projects Audited			30

12/17/2018 MOBILE SOURCE COMMITTEE MEETING

AGENDA ITEM #5 – ATTACHMENT 2

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

**TRANSPORTATION FUND FOR CLEAN AIR
PROGRAM MANAGER FUND**

AUDIT SUMMARY REPORT

PROJECT PERIOD ENDED JUNE 30, 2017

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

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MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

1 – INTRODUCTION

The Bay Area Air Quality Management District (Air District), created by the California legislature in 1955, is the state's first regional agency dealing with air pollution. The Air District regulates stationary sources of air pollution within the nine San Francisco Bay Area counties in California. The Air District's jurisdiction includes Alameda County, Contra Costa County, Marin County, Napa County, City/County of San Francisco, San Mateo County, Santa Clara County, southern Sonoma County, and south-western Solano County. The primary mission of the Air District is to achieve ambient air quality standards designed to protect the public's health and the environment. The Air District is governed by a twenty-two-member Board of Directors who has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction

2 – PROGRAM DESCRIPTION

Health and Safety Code Section 44223 and 44225 authorize a surcharge on the motor vehicle registration fee (surcharge) to be used by the Bay Area Air Quality Management District (Air District) and local governments specifically for programs to reduce air pollution from motor vehicles. The Department of Motor Vehicles collects the surcharge and allocates the amounts to the Air District. The Air District administers these funds through the Transportation Fund for Clean Air (TFCA) Program. Under the TFCA Program, money is allocated to two funds: (1) 60% is placed in the Regional Fund and allocated to agencies on a competitive basis by the Air District and (2) 40% is placed in the Program Manager Fund and allocated to designated agencies. Allowable projects under Health and Safety Code Section 44241 include the following:

- The implementation of ridesharing programs
- The purchase or lease of clean fuel buses for school districts and transit operators.
- The provision of local feeder bus or shuttle service to rail and ferry stations and to airports.
- Implementation and maintenance of local arterial traffic management, including, but not limited to, signal timing, transit signal preemption, bus stop relocation and "smart streets."
- Implementation of rail-bus integration and regional transit information systems.
- Implementation of demonstration projects in telecommuting and in congestion pricing of highways, bridges, and public transit.
- Implementation of vehicle-based projects to reduce mobile source emissions, including, but not limited to, engine repowers, engine retrofits, fleet modernization, alternative fuels, and advanced technology demonstrations.
- Implementation of a smoking vehicles program.
- Implementation of an automobile buy-back scrappage program operated by a governmental agency.
- Implementation of bicycle facility improvement projects that are included in an adopted countywide bicycle plan or congestion management program.
- The design and construction by local public agencies of physical improvements that support development projects that achieve motor vehicle emission reductions. The projects and the physical improvements shall be identified in an approved area-specific plan, redevelopment plan, general plan, or other similar plan.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

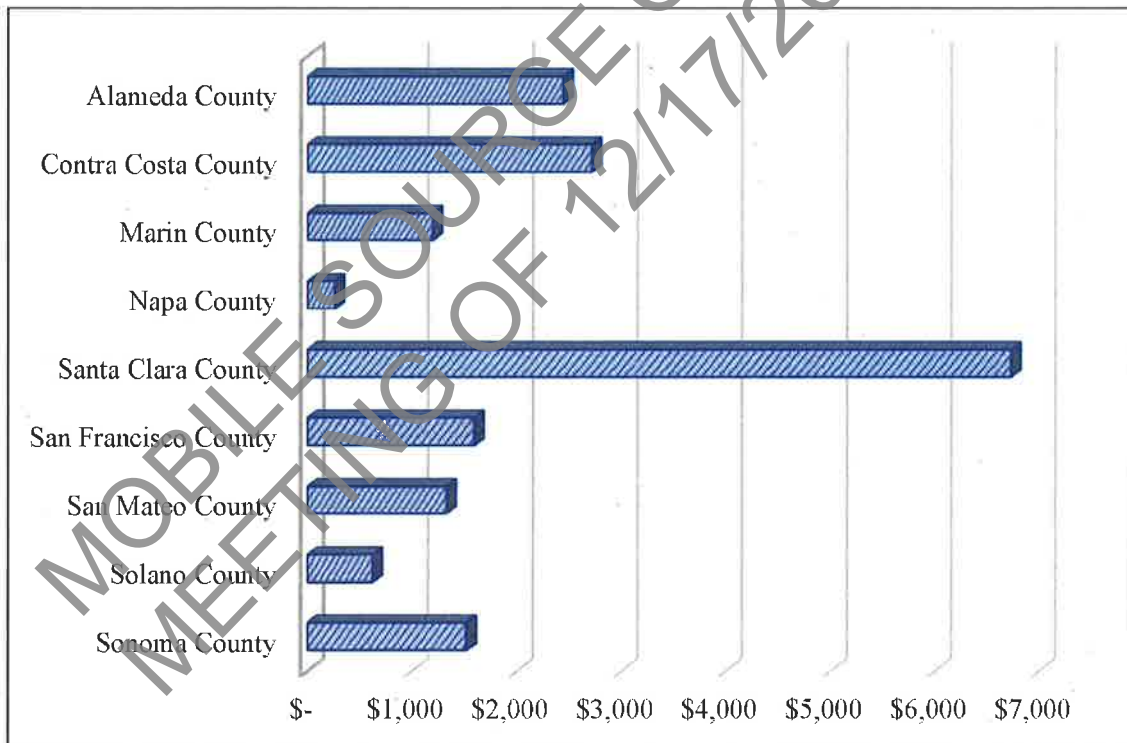
2 – PROGRAM DEISRIPTION (continued)

State law requires that any agency receiving TFCA funding be subject to an audit, at least once every two years. Health and Safety Code Section 44242 provides the legal compliance guidelines for the Air District to follow in the event revenues are not spent appropriately or when projects do not result in emission reductions. Health and Safety Code Sections 44241 and 44242 are provided in Appendix A.

The Air District retained the firm of Simpson and Simpson LLP to conduct financial and compliance audits of completed projects funded through the Program Manager Fund for the project period ended June 30, 2017.

The graph below reports the amount of TFCA Funds allocated to each of the individual Program Managers for projects that closed during the period from July 1, 2015 through June 30, 2017. These audits were performed during the period of May 2018 through November 2018. A list of audited projects is provided in Appendix B.

**Total Funds Expended by Program Manager for Projects Completed
During the Period of July 1, 2015 through June 30, 2017 (in thousands)**



**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

3 – AUDIT PROCESS

The audits were designed to address numerous financial and compliance objectives; however, the principal objectives of the audits were to (1) provide assurance that amounts reported in the Schedules of Expenditures are fairly stated, and (2) determine whether projects financed through the Air District's Program Manager Fund met funding agreement requirements. The audit procedures were specifically designed for TFCA financial and compliance requirements, which is described below. Unmodified opinions were issued on all 9 Program Managers' reports.

Audit of the Schedules of Expenditures

The financial audits were conducted in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States for the project period ended June 30, 2017. The expenditures under audit were TFCA expenditures, incurred by the Program Managers in the Air District's jurisdiction, related to projects that had been reported closed between July 1, 2015 and June 30, 2017.

Compliance Auditing Procedures

The audits were performed in accordance with the requirements outlined in the Health and Safety Code, individual funding agreements and Government Auditing Standards. The principal focus of the compliance auditing procedures was to ensure TFCA expenditures were paid in accordance with the program's objectives (Health and Safety Code Section (HSC) 44241). Compliance audits were planned and performed to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to in the HSC could have a direct and material effect on projects reported in the Schedules occurred.

The audit includes examining, on a test basis, evidence about the project sponsor's compliance with those requirements and performing such other procedures as considered necessary in the circumstances, as of the project period ended June 30, 2017.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

4 – PROGRAM MANAGER FINDINGS

Transportation Authority of Marin - Finding No. 2017-1 – Final Report Form Reporting

TFCA Project Affected

- Project Number: 10MAR07
- Project Sponsor: Transportation Authority of Marin
- Project Description: Central Marin Ferry Connection

Criteria

A Final Report Form (Form) is required to be submitted by the Transportation Authority of Marin (TAM) to the Bay Area Air Quality Management District (Air District) upon completion of the program project. The Form itemizes (a) the expenditure of the TFCA Funds, and (b) the results of the monitoring of the performance of each program project on Air District approved report forms.

Condition, Cause and Effect

We reviewed the Form covering TFCA project 10MAR07, which was submitted timely to the Air District on May 31, 2017. TAM reported on the Form the total *TFCA Funds Expended by the Authority for the TFCA Project* in the amount of \$142,000, which also represents the total TFCA funds awarded to the project.

We tested the accuracy of the total expended funds by reconciling the reported amount to the TAM's general ledger of costs charged to the project, which is reported on the Schedule of Expenditures of Projects (Schedule) as Final Project Expenditures through 6/30/2017.

We noted that \$103,128 of TFCA funds were expended on the project and not the reported \$142,000.

Questioned Costs

As a result, a total of \$38,872 was overreported for TFCA Project 10MAR07.

Recommendation

We recommend that TAM strengthen its controls to ensure accurate reporting of actual TFCA funds expended on projects, as reported on the Form to the Air District.

TAM's Response

The \$38,872 overreported cost is only an issue with the project closing report submitted in May 2017. The overreported amount was properly credited and accounted in the agency's TFCA fund as of June 30, 2013. The discrepancy was caused due to limited access to historic data hosted in Marin County's discontinued SAP Financial system in 2017. Now with the implementation of TAM's MIP Financial system, project funding report will provide timely and accurate information to prevent the same issue from happening again.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Audit Summary Report
For the Project Period Ended June 30, 2017**

4 – PROGRAM MANAGER FINDINGS (continued)

City/County Association of Governments of San Mateo County - Finding No. 2017-1 – Final Report Form Reporting

TFCA Projects Affected

- Project Number, Sponsor, Description:
 - 16SM01 - Peninsula Traffic Congestion Relief Alliance, Countrywide Voluntary Trip Reduction Program.
 - 16SM02 - San Mateo County Transit District, SanTrans Shuttle Program.

Criteria

A Final Report Form (Form) is required to be submitted by the City/County Association of Governments of San Mateo County (C/CAG) to the Bay Area Air Quality Management District (Air District) upon completion of the program project. The Form is to be submitted each May 31 and October 31, whichever date falls subsequent to the Project Completion Date.

Condition, Cause and Effect

We reviewed the Forms submitted for TFCA projects 16SM01 and 16SM02. The Project Completion Date for both projects was June 30, 2016. Accordingly, the Form should have been submitted to the Air District by the October 31, 2016 deadline.

We noted that the Forms were submitted untimely on November 18, 2016.

Questioned Costs

Not applicable. This finding is considered a programmatic non-compliance issue.

Recommendation

We recommend that C/CAG strengthen its controls to ensure timely submission of the Form to the Air District.

C/CAG's Response

C/CAG completes the Funding Status Report, while, accompanying Interim reports, Final reports and Cost-effectiveness worksheets comes from individual project sponsors.

C/CAG made the effort to submit the Funding Status Report Form to the Air District by the deadline on October 31, 2016 and informed the Air District that submission of the remaining accompanying reports would be delayed. Forms were subsequently submitted on November 18, 2016, as noted.

C/CAG will develop procedures to ensure timely submission of the Final Report Form to the Air District in the future. Procedures to be implemented includes providing more advanced notice to project sponsors with regards to reporting deadlines and allocating sufficient time to collate and confirm project information for reporting purposes.

APPENDIX A

HEALTH AND SAFETY CODE SECTIONS 44241 AND 44242

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Appendix A - Health and Safety Code Sections 44241 and 44242
For the Project Period Ended June 30, 2017**

44241

- (a) Fee revenues generated under this chapter in the bay district shall be subvned to the bay district by the Department of Motor Vehicles after deducting its administrative costs pursuant to Section 44229.
- (b) Fee revenues generated under this chapter shall be allocated by the bay district to implement the following mobile source and transportation control projects and programs that are included in the plan adopted pursuant to Sections 40233, 40717, and 40919:
 - (1) The implementation of ridesharing programs.
 - (2) The purchase or lease of clean fuel buses for school districts and transit operators.
 - (3) The provision of local feeder bus or shuttle service to rail and ferry stations and to airports.
*
 - (4) Implementation and maintenance of local arterial traffic management, including, but not limited to, signal timing, transit signal preemption, bus stop relocation and "smart streets."
 - (5) Implementation of rail-bus integration and regional transit information systems.
 - (6) Implementation of demonstration projects in telecommuting and in congestion pricing of highways, bridges, and public transit. No funds expended pursuant to this paragraph for telecommuting projects shall be used for the purchase of personal computing equipment for an individual's home use.
 - (7) Implementation of vehicle-based projects to reduce mobile source emissions, including, but not limited to, engine repowers, engine retrofits, fleet modernization, alternative fuels, and advanced technology demonstrations.
 - (8) Implementation of a smoking vehicles program.
 - (9) Implementation of an automobile buy-back scrappage program operated by a governmental agency.
 - (10) Implementation of bicycle facility improvement projects that are included in an adopted countywide bicycle plan or congestion management program.
 - (11) The design and construction by local public agencies of physical improvements that support development projects that achieve motor vehicle emission reductions. The projects and the physical improvements shall be identified in an approved area-specific plan, redevelopment plan, general plan, or other similar plan.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Appendix A - Health and Safety Code Sections 44241 and 44242
For the Project Period Ended June 30, 2017**

44241 (continued)

- (c) (1) Fee revenue generated under this chapter shall be allocated by the bay district for projects and programs specified in subdivision (b) to cities, counties, the Metropolitan Transportation Commission, transit districts, or any other public agency responsible for implementing one or more of the specified projects or programs. Fee revenue generated under this chapter may also be allocated by the bay district for projects and programs specified in paragraph (7) of subdivision (b) to entities that include, but are not limited to, public agencies, consistent with applicable policies adopted by the governing board of the bay district. Those policies shall include, but are not limited to, requirements for cost-sharing for projects subject to the policies. Fee revenues shall not be used for any planning activities that are not directly related to the implementation of a specific project or program.
- (2) The bay district shall adopt cost-effectiveness criteria for fee revenue generated under this chapter that projects and programs are required to meet. The cost-effectiveness criteria shall maximize emissions reductions and public health benefits.
- (d) Not less than 40 percent of fee revenues shall be allocated to the entity or entities designated pursuant to subdivision (e) for projects and programs in each county within the bay district based upon the county's proportionate share of fee-paid vehicle registration.
- (e) In each county, one or more entities may be designated as the overall program manager for the county by resolutions adopted by the county board of supervisors and the city councils of a majority of the cities representing a majority of the population in the incorporated area of the county. The resolution shall specify the terms and conditions for the expenditure of funds. The entities so designated shall be allocated the funds pursuant to subdivision (d) in accordance with the terms and conditions of the resolution.
- (f) Any county, or entity designated pursuant to subdivision (e), that receives funds pursuant to this section, at least once a year, shall hold one or more public meetings for the purpose of adopting criteria for expenditure of the funds, if those criteria have been modified in any way from the previous year. Any county, or entity designated pursuant to subdivision (e), that receives funds pursuant to this section, at least once a year, shall also hold one or more public meetings to review the expenditure of revenues received pursuant to this section by any designated entity. If any county or entity designated pursuant to subdivision (e) that receives funds pursuant to this section has not allocated all of those funds within six months of the date of the formal approval of its expenditure plan by the bay district, the bay district shall allocate the unallocated funds in accordance with subdivision (c).

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Appendix A - Health and Safety Code Sections 44241 and 44242
For the Project Period Ended June 30, 2017**

44242

- (a) Any agency which receives funds pursuant to Section 44241 shall, at least once every two years, undertake an audit of each program or project funded. The audit shall be conducted by an independent auditor selected by the bay district in accordance with Division 2 (commencing with Section 1100) of the Public Contract Code. The district shall deduct any audit costs which will be incurred pursuant to this section prior to distributing fee revenues to cities, counties, or other agencies pursuant to Section 44241.
- (b) Upon completion of an audit conducted pursuant to subdivision (a) the bay district shall do both of the following:
- (1) Make the audit available to the public and to the affected agency upon request.
 - (2) Review the audit to determine if the fee revenues received by the agency were spent for the reduction of air pollution from motor vehicles pursuant to the plan prepared pursuant to Sections 40233 and 40717.
- (c) If, after reviewing the audit, the bay district determines that the revenues from the fees may have been expended in a manner which is contrary to this chapter or which will not result in the reduction of air pollution from motor vehicles pursuant to that plan, the district shall do all of the following:
- (1) Notify the agency of its determination.
 - (2) Within 45 days of the notification pursuant to paragraph (1), hold a public hearing at which the agency may present information relating to expenditure of the revenues from the fees.
 - (3) After the public hearing, if the district determines that the agency has expended the revenues from the fees in a manner which is contrary to this chapter or which will not result in the reduction of air pollution from motor vehicles pursuant to the plan prepared pursuant to Sections 40233 and 40717, the district shall withhold these revenues from the agency in an amount equal to the amount which was inappropriately expended. Any revenues withheld pursuant to this paragraph shall be redistributed to the other cities within the county, or to the county, to the extent the district determines that they have complied with the requirements of this chapter.
- (d) Any agency which receives funds pursuant to Section 44241 shall encumber and expend the funds within two years of receiving the funds, unless an application for funds pursuant to this chapter states that the project will take a longer period of time to implement and is approved by the district or the agency designated pursuant to subdivision (e) of Section 44241. In any other case, the district or agency may extend the time beyond two years, if the recipient of the funds applies for that extension and the district or agency, as the case may be, finds that significant progress has been made on the project for which the funds were granted.

APPENDIX B
LISTING OF AUDITED PROJECTS

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

**Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Alameda County Transportation Commission:

Project Description	TFCA Project Number	Final Project Expenditures through 6/30/2017
Alameda County Transportation Commission		
Program Administration	15ALA00	\$ 104,848
Program Administration	16ALA00	96,642
Alameda County		
Mattox Road Bike Lanes	11ALA02	40,000
Alameda County Public Works		
Lake Chabot Road Class II Bicycle Lane	15ALA01	49,000
East Castro Valley Boulevard Class II Bike Lanes	16ALA01	62,000
AC Transit		
Route 51 Transit Signal Priority	14ALA11	123,821
BART		
BART West Oakland Bike Locker Plaza	16ALA11	55,000
California State University, East Bay		
CSUEB Campus Shuttle II	15ALA10	145,000
City of Berkeley		
Berkeley Citywide Bicycle Parking Project	14ALA02	110,092
City of Dublin		
Village Parkway Class 2 Bike Lanes	15ALA03	90,000
City of Fremont		
City of Fremont Arterial Management - Stevenson Blvd.	14ALA04	55,207
City of Oakland		
Traffic Signal Synchronization along Martin Luther King Jr. Way	11ALA09	122,698
Adeline St Bikeway Gap Closure Project	14ALA06	51,000
CityRacks Bicycle Parking Program, Phase 10	14ALA07	88,000
Oakland Broadway "B" Shuttle Peak Hour Operations	15ALA06	41,500
CityRacks, Phase 11	15ALA07	88,000
Broadway "B" Shuttle - Non-Peak (10am-3pm) Operations	16ALA06	210,000
City of Pleasanton		
Pleasanton Trip Reduction Program	14ALA09	118,000
City of San Leandro		
San Leandro LINKS	14ALA10	60,000
San Leandro LINKS shuttle	16ALA09	37,500
Livermore Amador Valley Transit Authority (LAVTA)		
Route 53 Operations	14ALA14	120,000
Route 54 Operations	14ALA15	47,000
LAVTA Route 8 Shuttle	15ALA11	55,000
LAVTA Route 12 Shuttle	15ALA12	101,500
LAVTA Route 15 Shuttle	15ALA13	96,000
LAVTA Route 30 BRT Operations	16ALA14	275,000
Total		\$ 2,442,808

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

**Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Contra Costa Transportation Authority:

<u>Project Description</u>	<u>TFCA Project Number</u>	<u>Final Project Expenditures through 6/30/2017</u>
Contra Costa Transportation Authority		
Program Administration	16CC00	\$ 72,659
Program Administration	17CC00	73,053
TRANSPAC/ City of Pleasant Hill		
Central/East SOV Trip/Emissions Reduction Program	15CC02	767,576
Central/East SOV Trip/Emissions Reduction Program	16CC02	795,205
County of San Ramon		
511CC Southwest Student Program	12CC07	151,626
511CC Southwest Employer Program	14CC05	73,283
511CC Southwest Student Program	14CC07	137,280
511CC Southwest Employer Program	15CC03	83,052
West Contra Costa Transportation Advisory Committee		
West County Employer Outreach	11CC02	94,024
West Contra Costs Commute Incentive Program	12CC01	60,000
West County Employer Outreach	12CC02	100,000
West County Emissions/ Trip Reduction Program	15CC01	305,149
Total		<u>\$ 2,712,907</u>

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

**Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Transportation Authority of Marin:

<u>Project Description</u>	<u>TFCA Project Number</u>	<u>Final Project Expenditures through 6/30/2017</u>
Transportation Authority of Marin		
Central Marin Ferry Connection	10MAR07	\$ 103,128
Central Marin Ferry Connection	11MAR05	10,972
Central Marin Ferry Connection	14MAR06	165,680
Emergency Ride Home Program	15MAR01	30,000
Vanpool Program	15MAR02	23,000
Program Administration	17MAR00	17,929
City of Novato		
Nave Drive Multi-Use Path	14MAR04	175,833
Nave Drive Multi-Use Path	15MAR03	303,446
County of Marin		
Miller Creek Road Class 2 Bicycle Lanes	11MAR04	51,000
Civic Center Drive Improvements	15MAR04	214,000
Golden Gate Bridge Highway & Transportation District		
Bike Racks on Buses	14MAR01	104,475
Total		\$ 1,199,463

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Napa County Transportation and Planning Agency:

Project Description	TFCA Project Number	Final Project Expenditures through 6/30/2017
Napa County Transportation and Planning Agency		
Program Administration	16NAP00	\$ 4,871
Program Administration	17NAP00	8,532
City of Napa		
Lincoln Signal Interconnect Project	10NAP05	177,693
Electric Vehicle Charging Station	14NAP04	12,144
Solano Napa Commuter Information		
SNCI Napa County Commute Challenge Marketing & Commuter Incentives	14NAP01	38,348
SNCI Napa County Marketing and Commuter Incentives	16NAP04	16,113
Total		\$ 257,701

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

**Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Santa Clara Valley Transportation Authority:

Project Description	TFCA Project Number	Final Project Expenditures through 6/30/2017
Santa Clara Valley Transportation Authority (SCVTA)		
Program Administration	16SC00	\$ 122,159
Program Administration	17SC00	122,912
City of Cupertino		
De Anza Blvd Traffic Signal Synchronization	16SC07	55,000
City of Milpitas		
City of Milpitas Electric Vehicle Level 2 Charging Stations	15SC02	20,200
City of Morgan Hill		
Install EV Chargers in Morgan Hill	15SC03	24,000
City of Mountain View		
Shoreline Boulevard Adaptive Signal Project	14SC04	800,000
City of Santa Clara		
Santa Clara Signal Timing & Interconnect Project	11SC01	1,168,128
Lafayette Street Signal Timing & Interconnect Project	12SC03	1,344,237
Mission College Signal Timing & Interconnect Project	14SC02	220,500
Stevens Creek Signal Timing & Interconnect Project	14SC03	360,000
Scott Boulevard Bike Lane Project	14SC06	102,650
County of Santa Clara, Roads and Airports Department		
County Expressway Signal Timing Coordination	15SC08	275,000
Almaden Expressway Weekday/ Weekend Traffic Responsive Signal	16SC09	245,000
City of Sunnyvale		
Wildwood Avenue Bicycle Lanes	12SC05	44,537
Mathilda Avenue Bicycle Lanes	12SC06	24,000
City of San Jose		
Public Bike Rack Purchase & Installation	14SC01	41,255
Santa Clara Valley Authority		
DASH Shuttle	15SC09	360,000
Electric Vehicle Charging Stations for Eastridge Transit Center	15SC10	50,000
Santa CLARA Caltrain Station Bike/ Ped Tunnel	15SC13	116,816
DASH Shuttle	16SC02	408,000
DASH Shuttle	17SC01	826,000
Total		\$ 6,730,394

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

**Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

San Francisco County Transportation Authority:

Project Description	TFCA Project Number	Final Project Expenditures through 6/30/2017
San Francisco County Transportation Authority		
SF Integrated TDM Partnership Project - Network of TMAs	11SF07	\$ 141,084
Program Administration	16SF00	36,861
Program Administration	17SF00	37,556
Golden Gate Bridge, Highway & Transportation District		
Bike Racks on Buses	15SF01	100,000
Golden Gate National Recreation Area, National Park		
Presidio Coastal Trail- Phase II	12SF04	120,000
San Francisco Department of the Environment		
Emergency Ride Home Program	15SF03	24,676
Emergency Ride Home Program	16SF01	41,838
San Francisco Municipal Transportation Agency		
Alternative Fuel Taxicab Vehicle Incentive Program	12SF05	69,251
Short Term Bicycle Parking	14SF05	180,885
Alternative Fuel Taxicab Vehicle Incentive Program	15SF05	198,444
Corridor Speed Reduction	15SF06	120,892
San Francisco Comprehensive TDM Program	15SF07	470,249
San Francisco Unified School District		
Bike Racks for SF Schools	15SF08	52,500
Total		\$ 1,594,236

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

City/County Association of Governments of San Mateo County:

Project Description	TFCA Project Number	Final Project Expenditures through 6/30/2017
City/County Association of Governments		
Program Administration	16SM00	\$ 39,564
Program Administration	17SM00	32,610
Peninsula Traffic Congestion Relief Alliance		
Countywide Voluntary Trip Reduction Program	16SM01	472,300
Countywide Voluntary Trip Reduction Program	17SM01	525,000
SamTrans		
SamTrans Shuttle Program	17SM02	109,000
San Mateo County Transit District		
SamTrans Shuttle Program	16SM02	154,500
Total		\$ 1,332,974

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND
Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Solano Transportation Authority:

<u>Project Description</u>	<u>TFCA Project Number</u>	<u>Final Project Expenditures through 6/30/2017</u>
Solano Transportation Authority		
Program Administration	15SOL00	\$ 15,564
Program Administration	16SOL00	16,149
Program Administration	17SOL00	15,935
Solano Commute Alternatives Incentive Activities and Outreach Program	14SOL01	220,000
Safe Routes to School High School Trip Reduction Pilot	14SOL03	24,981
Solano Commute Alternatives Outreach and Incentives Program	15SOL01	294,709
Solano College		
Solano College Student Transit Voucher	14SOL02	36,922
Suisun City		
Suisun City Capital Corridor Park and Ride Charging Station	14SOL04	2,000
Total		\$ 626,260

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
TRANSPORTATION FUND FOR CLEAN AIR PROGRAM MANAGER FUND**

**Appendix B – Listing of Audited Projects
For the Project Period Ended June 30, 2017**

Sonoma County Transportation Authority:

Project Description	TFCA Project Number	Final Project Expenditures through 6/30/2017
Sonoma County Transportation Authority		
Program Administration	16SON00	\$ 22,779
Program Administration	17SON00	29,651
City of Petaluma		
Petaluma Transit Marketing	15SON03	58,474
Youth Bus Subsidy Program	15SON04	25,000
Youth Bus Subsidy Program	16SON03	16,000
Petaluma Transit Marketing	16SON04	64,006
Electric Vehicle Charger Installation	16SON06	13,841
City of Santa Rosa, Transit Department		
Santa Rosa Trip Reduction Incentive Program	15SON01	241,452
Santa Rosa Trip Reduction Incentive Program	16SON01	230,892
Sonoma County Transit		
Passenger Information System	11SON01	227,955
Countywide Bus Stop Enhancements and Transit Hubs	13SON06	82,299
Transit Marketing Program	14SON03	60,000
Transit Shelters at Sonoma County Administration Center	14SON04	77,983
Sebastopol Shuttle Bus Stop Improvements	14SON05	74,773
Transit Marketing Program	15SON02	146,278
Town of Windsor		
Pedestrian Signal Enhancement Project – Phase II	14SON06	151,687
Total		\$ 1,523,070

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson Scott Haggerty and Members
of the Mobile Source Committee

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 4, 2018

Re: Report on Transportation Fund for Clean Air (TFCA) Projects Expenditures and Effectiveness for Fiscal Year Ending (FYE) 2018

RECOMMENDED ACTION

None; receive and file.

BACKGROUND

In 1991, the California State Legislature authorized the Bay Area Air Quality Management District (Air District) to impose a \$4 surcharge on motor vehicles registered within the nine-county Bay Area to fund projects that reduce on-road motor vehicle emissions. Since 1992, the Air District has allocated these funds to its Transportation Fund for Clean Air (TFCA) Program to fund eligible projects and programs. The statutory authority for the TFCA and requirements of the program are set forth in California Health and Safety Code (HSC) Sections 44241 and 44242.

Sixty percent of TFCA funds are awarded by the Air District to eligible projects and programs implemented directly by the Air District (e.g., Spare the Air and Commuter Benefits Program) and through a grant program known as the Regional Fund. The remaining 40% of TFCA funds are forwarded to a designated agency ("County Program Manager") within each Bay Area county to be distributed via the County Program Manager Fund.

HSC Section 44241 requires that the Board hold a public hearing each year to review the Air District's expenditure of TFCA funds to determine their effectiveness in improving air quality. Additionally, County Program Managers are required to hold a public hearing each year to review their expenditure of TFCA funds.

DISCUSSION

A total of 76 projects and three programs were evaluated as part of the fiscal year ending (FYE) 2018 Report on Transportation Fund for Clean Air Projects Expenditures and Effectiveness that is found in Attachment 1. The report covers TFCA Regional Fund projects and Air District-sponsored programs that were completed by June 30, 2018 that have not been evaluated in previous reports. The following are key findings of the FYE 2018 report:

- TFCA funds were allocated to eligible projects and programs, consistent with the legislation that authorizes the TFCA program.
- The TFCA expenditures for projects and programs included in this report totaled \$11.12 million. This includes \$8.73 million in Regional Fund projects and \$2.39 million in Air District-sponsored programs. An additional \$0.99 million in TFCA funds was spent on administrative and indirect costs in FYE 2018.
- During their operational period, the projects and programs included in this report are estimated to have reduced criteria pollutant emissions by over 173.28 tons, including 55.27 tons of reactive organic gases (ROG), 48.94 tons of nitrogen oxides (NO_x), and 69.07 tons of particulate matter (PM₁₀), and carbon dioxide (CO₂), a greenhouse gas, by over 105,000 tons.
- The projects and programs included in this report achieved a combined weighted average cost-effectiveness of \$55,896 per ton of weighted criteria pollutant emissions reduced.

A discussion of the expenditures, emission reductions, and cost-effectiveness of these TFCA Regional Fund projects and Air District-sponsored programs will be presented at the Committee meeting.

BUDGET CONSIDERATION / FINANCIAL IMPACT

None. The Air District distributes TFCA monies as “pass-through” funds to public and nonpublic entities. Administrative costs for project staff are provided by the Air District’s TFCA funding.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Josephine Fong and Linda Hui
Reviewed by: Karen Schkolnick, Chengfeng Wang and Ken Mak

Attachment 1: Fiscal Year Ending (FYE) 2018 Report on Expenditures and Effectiveness of Transportation Fund for Clean Air (TFCA) Regional Fund Projects and Air District-Sponsored Programs

FISCAL YEAR ENDING (FYE) 2018
REPORT ON EXPENDITURES AND EFFECTIVENESS OF
TRANSPORTATION FUND FOR CLEAN AIR (TFCA)
REGIONAL FUND PROJECTS AND AIR DISTRICT-SPONSORED PROGRAMS



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

375 BEALE STREET, SUITE 600, SAN FRANCISCO, CA 94105

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DECEMBER 2018

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MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

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MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT

The California State Legislature created the Bay Area Air Quality Management District (Air District) in 1955 as the first regional air pollution control agency in the country, recognizing that air emissions overflow political boundaries. The San Francisco Bay Area forms a regional air basin, sharing common geographical features and weather patterns, and therefore similar air pollution burdens, which cannot be addressed by counties acting on their own.

The Air District is the public agency entrusted with regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties.

BACKGROUND

On-road motor vehicles, including cars, trucks, and buses, constitute the most significant source of air pollution in the San Francisco Bay Area. Vehicle emissions contribute to unhealthy levels of ozone (summertime "smog"), particulate matter, and greenhouse gases. Because of this, emission reductions from the on-road transportation sector are essential to helping the region attain State and Federal ambient air quality standards and meet greenhouse gas reduction commitments.

To protect public health, the California State Legislature enacted the California Clean Air Act in 1988. As part of the requirements, the Air District prepared and adopted the *2017 Clean Air Plan (CAP)*, which includes transportation control measures (TCMs), defined as any strategy "to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for reducing motor vehicle emissions," and mobile source measures (MSMs), which encourage the introduction of newer, cleaner motor vehicle technologies and the retirement of older, more polluting vehicles.

THE TRANSPORTATION FUND FOR CLEAN AIR (TFCA)

In 1991, the California State Legislature authorized the Air District to impose a \$4 surcharge on motor vehicles registered within the San Francisco Bay Area to fund projects that reduce on-road motor vehicle emissions. The Air District has allocated these funds to its Transportation Fund for Clean Air (TFCA) to fund eligible projects. The statutory authority for the TFCA and requirements of the program are set forth in California Health and Safety Code (HSC) Sections 44241 and 44242.

Sixty percent of TFCA funds are awarded by the Air District's Board of Directors (Board) to eligible projects and programs implemented directly by the Air District (e.g., the Commuter Benefits, Vehicle Buy-Back, and Spare the Air) and through a grant program known as the Regional Fund. The remaining forty percent of TFCA funds are pass-through funds to a designated agency within each Bay Area county to be distributed via the County Program Manager Fund. Each year, the Board adopts cost-effectiveness and other criteria for the evaluation and ranking of project applications for the TFCA Program.

In addition to reducing air pollution, including toxic particulate matter, TFCA-funded projects have other benefits including the following:

- Conserving energy and helping to reduce emissions of carbon dioxide (CO₂), a greenhouse gas;
- Reducing traffic congestion;

- Improving quality of life for residents and commuters by expanding access to services that provide first- and last-mile connections to rail, ferry, and mass transit; and
- Improving physical fitness and public safety by facilitating active modes of transportation such as walking and biking.

State legislation restricts TFCA funding to the following 11 types of projects:

- Implementation of ridesharing programs
- Clean fuel school and transit bus purchases or leases
- Feeder bus or shuttle service to rail and ferry stations and to airports
- Arterial traffic management
- Rail-bus integration and regional transit information systems
- Demonstrations in congestion pricing of highways, bridges and public transit
- Low-emission vehicle projects
- Smoking vehicles program
- Vehicle buy-back scrappage program
- Bicycle facility improvement projects
- Physical improvements that support “smart growth” projects

California HSC Section 44241.5 requires the Board to hold a public hearing annually to review the expenditure of revenues received by the Air District pursuant to Section 44241 to determine their effectiveness in improving air quality. This report serves this purpose.

FYE 2018 SUMMARY

This report summarizes the expenditures and effectiveness of the TFCA Regional Fund projects and Air District-sponsored programs that were completed by the end of fiscal year ending (FYE) 2018, which was June 30, 2018, but that have not been evaluated in previous reports¹. **Appendix A** lists the 76 projects and 3 programs that were summarized as part of this report.

¹ For the purpose of this report, staff considers a project to be “completed” when the Air District accepts and approves the project sponsor’s final invoice, which documents the project sponsor’s expenditure of all eligible project funds and the completion of all initial project milestones (e.g., having procured and/or placed all project-related vehicles, equipment, and infrastructure into service). Projects that involve the procurement of equipment/vehicles and construction of infrastructure typically also require continued operation of the funded equipment, vehicles, or infrastructure. These projects may continue to operate for several years until the operational and usage requirements are met.

Key Highlights of the Projects and Programs Included in this Report

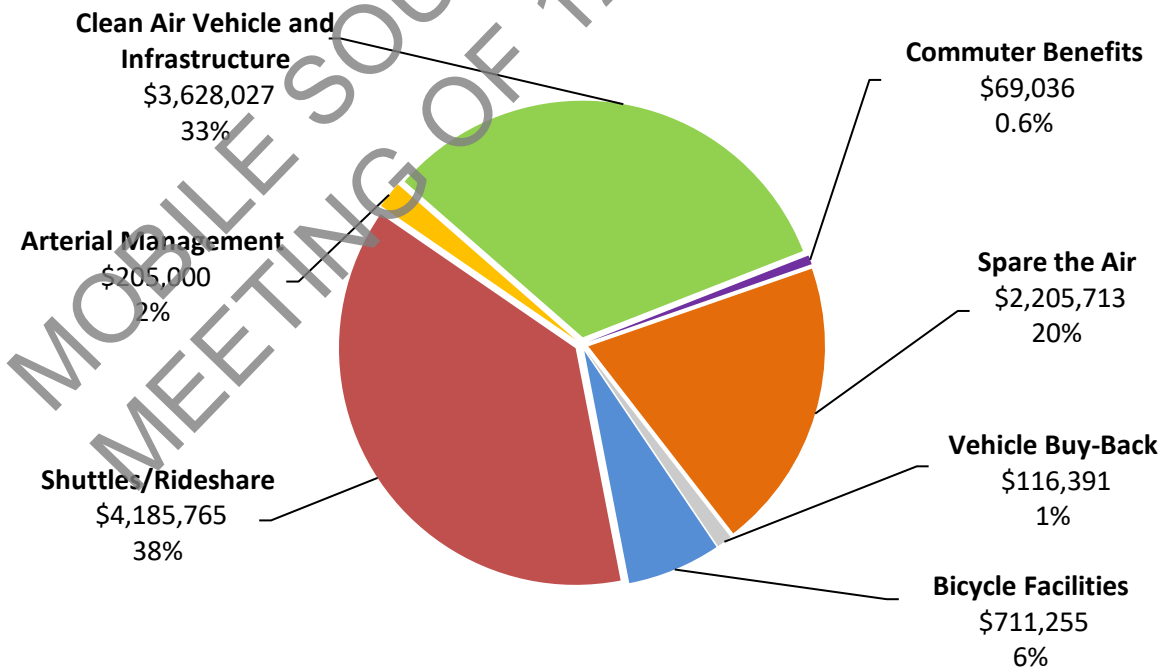
- TFCA funds were allocated to eligible projects and programs, consistent with the legislation that authorizes the TFCA program.
- The TFCA expenditures for projects and programs totaled \$11.12 million. This includes \$8.73 million in Regional Fund projects, \$2.39 million in Air District-sponsored programs, and \$0.99 million in administrative and indirect costs.
- During their operational period, the projects and programs reduced criteria pollutant emissions by an estimated 173.28 tons, including 55.27 tons of reactive organic gases (ROG), 48.94 tons of nitrogen oxides (NO_x), and 69.07 tons of particulate matter (PM₁₀), and carbon dioxide (CO₂), a greenhouse gas, by over 105,000 tons.
- These projects and programs achieved a combined weighted average cost-effectiveness of \$55,896 per ton of criteria pollutant emissions reduced.

EXPENDITURES

The expenditure of these projects and programs totaled to \$11.12 million. This total includes \$2.39 million for the programs administered directly by the Air District and \$8.73 million in Regional Fund grants to other organizations. In addition, the Air District expended \$0.99 million in administrative and audit costs associated with the oversight of the TFCA program in FYE 2018.

A summary of the expenditures for these TFCA Regional Fund projects and Air District-sponsored programs is shown in **Figure 1**.

Figure 1. Summary of Expenditures



EFFECTIVENESS

The cost-effectiveness of projects and programs is calculated by dividing the amount of TFCA funds invested or awarded by the amount of criteria pollutant emissions (ROG, NO_x, and weighted PM₁₀ combined) reduced during the project operational period. Projects with a lower number for cost-effectiveness require less amount of TFCA funds to reduce one ton of criteria emissions and are more effective in reducing emissions and improving air quality.

These projects and programs are anticipated to reduce criteria pollutant emissions over their operational periods by an estimated total of 173.28 tons. This total is the sum of ozone precursors (55.27 tons of ROG and 48.94 tons of NO_x) and particulate matter (69.07 tons of PM₁₀). The reduction of CO₂ emissions over their project operational periods is estimated to be over 105,000 tons.²

Additionally, these projects and programs achieved a combined weighted average cost-effectiveness of \$55,896 per ton of criteria pollutant emissions reduced. Note that many projects continue to operate and reduce emissions after their operational periods ended and thus the projects could be more effective (i.e. lower cost per ton of emissions reduced) in reducing emissions than what is presented in this report.

A summary of expenditures, emission reductions, and cost-effectiveness values by program category is provided in **Table 1**.

Table 1: Emission Reductions and Cost-Effectiveness by Program Category for Projects and Programs That Completed by the End of FYE 2018

Category	# of Projects	TFCA \$ Expended	% of TFCA \$ Expended	Emissions Reduced (tons) ^a	% of Emissions Reduced	Weighted Cost-Effectiveness (\$/ton) ^b
Bicycle Facilities	21	\$ 711,255	6.40%	10.72	6.19%	\$61,373
Shuttles/Rideshare	9	\$4,185,765	37.64%	44.38	25.61%	\$82,712
Arterial Management	1	\$205,000	1.84%	3.54	2.04%	\$41,447
Clean Air Vehicle & Infrastructure	45	\$3,628,027	32.62%	8.68	5.01%	\$202,981
Commuter Benefits Program	1	\$69,036	0.62%	2.70	1.56%	\$23,708
Spare the Air Program	1	\$2,205,713	19.83%	103.27	59.60%	\$20,245
Vehicle Buy-Back Program	1	\$116,391 ^c	1.05%	-	-	-
Total for Projects and Programs^d	79	\$11,121,186	100%	173.28	100%	\$55,896
Administration		\$990,697				

(a) Combined emission reductions of ROG, NO_x, and PM₁₀ over project operational period.

(b) Consistent with the current California Air Resources Board methodology to calculate cost-effectiveness for the Carl Moyer Program (CMP), PM emissions were weighted by a factor of 20 to account for their harmful impacts on human health.

(c) Total FYE 2018 program cost was \$5,743,755.40, which includes funds from CMP, Mobile Source Incentive Fund (MSIF), and TFCA.

(d) Totals may vary due to rounding.

² Emission reductions reported for criteria pollutants or CO₂ do not include emissions from the Vehicle Buy-Back Program.

Two of the projects and programs listed in Appendix A have realized emission reductions that are lower than the required amount to meet the cost-effectiveness threshold.

Project #12R16 involved an existing shuttle service in San Francisco with a final cost-effectiveness of \$100,199, which exceeds the FYE 2012 shuttle and ridesharing cost-effectiveness threshold of \$90,000. Although this project reduced more vehicle-miles-travelled (VMT) than what was estimated based on information provided in the project sponsor's application, the final estimated amount of emission reductions from this project was lower than what was anticipated because the passenger car exhaust PM emission factor used in calculating the emission reductions benefit was updated to a lower number upon the completion of this project.

Project #16R22 involves purchasing and installing one eLocker quad and two eLocker doubles in the City of Campbell. The final cost-effectiveness of this project is \$97,945, which exceeds the FYE 2016 bicycle facilities cost-effectiveness threshold of \$90,000. Due to cost-inefficiencies for project sponsors of electronic bicycle locker projects to collect usage data, they are not required to report usage data to the Air District upon project completion. The post-project cost-effectiveness calculation is based on estimated trip reduction assumptions, which may not reflect actual usage. Staff is exploring options to refine and improve the methodology that is used to evaluate this project type to better reflect the realized cost-effectiveness of these projects.

MOBILE SOURCE COMMITTEE
MEETING OF 12/17/2018

APPENDIX A: TFCA REGIONAL FUND PROJECTS AND AIR DISTRICT-SPONSORED PROGRAMS

Project #	Project Sponsor	Project Description	Weighted Cost- Effectiveness (\$/ton)	TFCA Funds Expended (\$)
04R62	Alameda Contra Costa Transit District	Oakland MacArthur Corridor Transit Bus Traffic Signal Prioritization	41,447	205,000
09R28	East Bay Clean Cities Coalition	US DOE Clean Cities Coalition Outreach	12,148	25,000
09R47	University of California Berkeley	TSRC Richmond High-Pressure Hydrogen Fueling Facility and Fuel-Cell-Vehicle Demo	326,652	97,218
09R59	McDonalds	(54) Electric Vehicle Charging Spots	67,771	53,280
12R14	Peninsula Corridor Joint Powers Board	Caltrain Shuttles	65,362	992,823
12R16	The Presidio Trust	Shuttle PresidiGo	100,199	100,000
13BR001	Dougherty Elementary	Purchase and install nine bike racks for Dougherty Elementary (18 capacity)	90,000	1,080
13BR002	Old Mill School	Purchase and install three bike racks for Old Mill School (12 capacity)	90,000	720
13BR003	Reed Union School District	Purchase and install six bike racks for Reed Union School District (36 capacity)	90,000	2,160
13BR005	Tamalpais Valley School	Purchase and install 10 bike racks for Tamalpais Valley School (40 capacity)	90,000	2,400
13BR006	City of Emeryville	Purchase and install bike racks for City of Emeryville (136 Capacity)	79,053	7,168
13BR009	Town of Yountville	Purchase and install 22 bike racks for Town of Yountville (44 bike capacity)	90,000	2,640
13BR011	City of Piedmont	Purchase and install 29 bike racks for City of Piedmont (58 capacity)	77,909	3,013
13BR013	Terman Middle School	Purchase and install 49 bike racks for Terman Middle School (196 capacity)	90,000	11,760

Project #	Project Sponsor	Project Description	Weighted Cost-Effectiveness (\$/ton)	TFCA Funds Expended (\$)
13BR018	Walter T. Helms Middle School	Purchase and install five bike racks for Walter T. Helms Middle School (10 capacity)	85,905	573
13BR020	Burlingame School District	Purchase and install six bike racks for Burlingame School District (22 Bike Capacity)	90,000	2,760
13BR021	Alameda County General Services Agency	Purchase and install 25 bike racks in the City of Oakland and Hayward (50 capacity)	80,625	2,688
13BR025	City of Richmond	Purchase and install 24 bike racks for City of Richmond (56 capacity)	88,929	3,320
13BR034	City of Martinez	Purchase and install 30 bike racks for City of Martinez (60 capacity)	73,252	2,921
14PEV002	County of Sonoma	22 Battery EVs for County of Sonoma	420,000	55,000
14PEV003	City of Morgan Hill	1 Battery EV for City of Morgan Hill	420,000	2,500
14R19	San Francisco Bay Area Water Emergency Transportation Authority	Purchase and Install 5 eLocker Quads (20 total lockers) for San Francisco Bay Area Water Emergency Transportation Authority	48,640	45,037
15BR003	Town of Yountville	Purchase and install seven bike racks for the Town of Yountville (14 capacity)	90,000	840
15BR011	Town of Windsor	Purchase and install 40 bike racks for Town of Windsor (80 bike capacity)	77,496	4,133
15DCFC01	Federated Indians of Graton Rancheria	Install 2 dual-connector DC fast and 2 dual-port level 2 charging stations in Rohnert Park	250,000	135,196
15DCFC03	Alameda Municipal Power	Alameda Municipal Power DC fast charging station project	225,261	84,912
15R18	Bay Area Rapid Transit District	Purchase and Install 28 eLocker Quads (112 total lockers) for Bay Area Rapid Transit	51,704	268,095
15R23	Capitol Corridor Joint Powers Authority	Capitol Corridor eLockers Project	44,182	90,000

Project #	Project Sponsor	Project Description	Weighted Cost-Effectiveness (\$/ton)	TFCA Funds Expended (\$)
15R27	FirstElement Fuel Inc.	FE Hydrogen Station Network Development (7 stations)	188,877	875,000
15R31	HTEC Hydrogen Technology & Energy Corporation	The Skyline Hydrogen Energy Center (1 station)	219,097	145,000
16DCFC01	City of Saratoga	Install 1 dual-connector DC fast charging station in Saratoga	250,000	35,000
16DCFC03	City of Brisbane	Install 1 dual-connector DC fast charging station in Brisbane	250,000	40,000
16EV001	Car Charging, Inc.	Install 10 single-port Level 2 charging stations in San Jose	250,000	30,000
16EV005	DTTC Properties, LLC	Install 3 single-port Level 2 charging stations (with solar) in Campbell	500,000	22,500
16EV009	Clear Blue Commercial	Install 6 single-port Level 2 charging stations in Petaluma	250,000	18,000
16EV012	Santa Clara Campus Owners' Association	Install 98 dual-port level 2 charging stations in Santa Clara	250,000	338,546
16EV019	California State University, East Bay	Install 2 dual-port Level 2 charging stations in Hayward	250,000	12,000
16EV021	Ford Point LLC	Install 1 DC fast and 8 dual-port Level 2 charging stations in Richmond	250,000	73,000
16EV023	Ferrotec (USA) Corporation	Install 2 dual-port Level 2 charging stations in Livermore	250,000	8,229
16EV026	Straus Family Creamery	Install 4 single-port Level 2 charging stations in Petaluma and Marshall	250,000	11,040
16EV030	Crow Canyon Medical Center, L.P.	Install 4 single-port Level 2 charging stations (with solar) in Danville	500,000	24,000
16EV032	Komuna Energy, LLC	Install 9 dual-port Level 2 charging stations (with solar) in City of Palo Alto	500,000	108,000

Project #	Project Sponsor	Project Description	Weighted Cost-Effectiveness (\$/ton)	TFCA Funds Expended (\$)
16EV035	Menlo Park City School District	Install 4 dual-port Level 2 charging stations in Menlo Park	250,000	24,000
16EV038	Artemedica	Install 2 dual-port Level 2 charging stations (with solar) in Santa Rosa	500,000	24,000
16EV040	Sonoma State University	Install 2 dual-port and 2 single-port Level 2 charging stations in Rohnert Park	250,000	14,000
16EV043	Peninsula Components Inc.	Install 1 quad-port and 1 dual-port Level 2 charging stations in San Carlos	250,000	10,364
16EV044	Siemens Healthcare Diagnostics, Inc.	Install 4 single-port Level 2 charging stations in Berkeley	250,000	10,000
16EV046	3901 North First LLC	Install 5 dual-port Level 2 charging stations in San Jose	250,000	30,000
16EV048	Kehillat Etz Chayim	Install 4 single-port Level 2 charging stations (with solar) in Palo Alto	500,000	24,000
16EV049	One Hawthorne Owners Association	Install 4 single-port Level 2 charging stations in San Francisco	250,000	10,319
16EV051	8 Octavia Boulevard Owners' Association	Install 4 single-port Level 2 charging stations in San Francisco	250,000	12,000
16EV061	Amy's Kitchen	Install 3 dual-port Level 2 charging stations in Petaluma	250,000	10,500
16R15	San Joaquin Regional Rail Commission	ACE Shuttle 53 and 54	66,253	80,000
16R17	Presidio Trust	PresidiGo Shuttle	88,417	100,000
16R19	Peninsula Corridor Joint Powers Board	Caltrain Shuttle Program	98,931	753,700
16R20	Santa Clara Valley Transportation Authority	ACE Shuttle Bus Program	84,773	959,999
16R22	City of Campbell	City of Campbell Electronic Bicycle Locker Project	97,945	19,949

Project #	Project Sponsor	Project Description	Weighted Cost-Effectiveness (\$/ton)	TFCA Funds Expended (\$)
16R23	Bay Area Rapid Transit District	Purchase and install 20 eLocker quads in Berkeley, Dublin/Pleasanton, Millbrae, San Leandro, Fremont, and Union City	90,000	200,000
16R24	Capitol Corridor Joint Powers Authority	Purchase and install 4 eLocker quads in Emeryville and Santa Clara	90,000	40,000
16RFG01	Chabot Las Positas Comm College District	Install 12 Dual-Port level 2 charging stations in Livermore and Hayward	190,000	65,112
16RFG02	City of Fremont	Install 9 dual port level 2 charging stations in Fremont	250,000	81,486
16RFG08	City of Millbrae	Install 8 Dual-Port Level 2 Charging Stations in Millbrae	250,000	78,000
16RFG09	City of Oakland	Install 1 dual-connector DC fast, and 5 dual-port Level 2 EV charging stations in Oakland	250,000	39,289
16RFG11	The NASA Ames Exchange	Install 8 DC fast charging stations in Moffett Field	250,000	342,014
16RFG15	City of Palo Alto	Install 1 dual port and 1 single port Level 2 charging station in Palo Alto	250,000	20,000
16RFG17	City of Richmond	Install 1 DC fast and 1 Single-port Level 2 EV charging station in Richmond	250,000	47,511
16RFG18	San Francisco Bay Area Rapid Transit District (BART)	Install 20 Dual-Port and 2 Single-Port Level 2 Charging Stations in Fremont	250,000	250,000
16RFG19	County of Alameda	Install 1 DC fast, and 7 dual-port Level 2 charging stations in Oakland and Alameda	250,000	133,365
17EV002	Efficient Drivetrains, Inc.	Install 4 dual-port Level 2 charging stations in Milpitas	229,307	16,000
17EV004	MPVCA Brisbane LLC	Install 3 dual-port Level 2 charging stations in Brisbane	229,307	12,000
17EV007	Mountain View Los Altos High School District	Install 26 single-port Level 2 charging stations in Mountain View	244,584	72,646

Project #	Project Sponsor	Project Description	Weighted Cost-Effectiveness (\$/ton)	TFCA Funds Expended (\$)
17EV022	Los Altos High School	Install 26 single-port Level 2 and 1 DC fast charging stations in Los Altos	213,723	96,000
17EV025	BCSP Crossroads Property LLC	Install 3 dual-port Level 2 charging stations in San Mateo	229,307	12,000
17R12	Associated Students, San Jose State University	SJSU Ridesharing & Trip Reduction	59,115	139,330
17R15	San Joaquin Regional Rail Commission	ACE Shuttle 53 and 54	84,993	100,000
17R16	Santa Clara Valley Transportation Authority	ACE Shuttle Bus Program	99,946	959,914
76	Projects	Subtotal Regional Fund Projects:		\$8,730,046

Project #	Project Sponsor	Project Description	Weighted Cost-Effectiveness (\$/ton)	TFCA Funds Expended (\$)
18R01	BAAQMD	FYE 2018 Commuter Benefits	23,708	69,036
18R02	BAAQMD	FYE 2018 Admail for Vehicle Buy-Back (TFCA portion)*	N/A	116,391
18R03	BAAQMD	FYE 2018 Spare the Air	20,245	2,205,713
3	Programs	Subtotal Air District-Sponsored Programs:		\$2,391,140
18R00	BAAQMD	FYE 2018 Administration**	N/A	990,696.52
Subtotal Administration for Regional Fund Projects and Air District-Sponsored Programs:				\$990,697
GRAND TOTAL:				\$12,111,883

* Total FYE 2018 program cost (which includes funds from CMP, MSIF, and TFCA) is \$5,743,755.

** Sixty percent of the total administrative and audit costs expended in FYE 2018.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 10, 2018

Re: Report of the Legislative Committee Meeting of December 17, 2018

RECOMMENDED ACTION

A) Review of the 2018 Legislative Year

1) None; receive and file.

B) Discussion of Potential 2019 Legislative Agenda

2) Consider recommending a legislative agenda to the Board for adoption.

BACKGROUND

The Committee will meet on Monday, December 17, 2018, and will receive the following reports and recommendations:

A) Review of the 2018 Legislative Year; and

B) Discussion of Potential 2019 Legislative Agenda

Legislative Committee Chairperson, Doug Kim, will give an oral report of the meeting.

BUDGET CONSIDERATION/FINANCIAL IMPACT

A) The District's primary legislative goal for 2018 was to secure funding to implement AB 617. This was particularly challenging, since the Department of Finance and key leadership staff in the Assembly tried to block our efforts to secure funding throughout the year. Their argument essentially was that air districts should recover all costs for AB 617 implementation through fees on industry. While that was and remains both legally impossible and impractical, Finance especially is likely to continue to assert their position in 2019.

However, staff orchestrated a campaign spearheaded by Assemblymember Tim Grayson (joined by 49 other members of the Legislature) that ultimately resulted in a \$50 million statewide allocation as part of the budget process. This was part of the cap-and-trade expenditure plan, and there was commitment by the 2018 Legislature and staff that this

same level of funding should continue in 2019. However, items in the 2019 budget cannot be decided in advance, so more work will be required in the upcoming year to try to yet again secure funding for the major ongoing workload required by AB 617.

Another key budget issue for the District were the statewide allocations of a substantial \$245 million for incentive programs in AB 617 communities, and a paltry \$3 million for wood smoke incentive programs. Both allocations are also from the Greenhouse Gas Revenue Fund (GGRF), part of the cap-and-trade expenditure plan. The District was also part of a California Air Pollution Control Officers Association (CAPCOA)-led coalition that successfully blocked a Department of Finance proposal to grab Moyer revenues from tire fees (\$26 million annually) and divert it to the Department of Fish and Wildlife. Finance suggested that the Moyer program be backfilled with GGRF revenues. Because demand for GGRF funds exceeds their supply, and we would have had to have fought for the backfill every year, this raid on the Moyer program would have been highly detrimental to our incentive programs. The Finance proposal ultimately was successfully opposed by a diverse coalition of environmental and industry groups, organized by CAPCOA; and

B) None.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Marcy Hiratzka
Reviewed by: Vanessa Johnson

Attachment 11A: 12/17/18 – Legislative Committee Meeting Agenda #4
Attachment 11B: 12/17/18 – Legislative Committee Meeting Agenda #5

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson Kim and Members
of the Legislative Committee

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 6, 2018

Re: Review of the 2018 Legislative Year

RECOMMENDED ACTION

None; review and file.

BACKGROUND

On September 1, 2018, the California Legislature ended its work for the 2017-2018 session. The Legislature introduced 2,225 bills this year, and 1,217 of these (or 55%) made it to Governor Brown. Governor Brown in his final year in office, vetoed almost 17% of the bills. Forty five percent of bills introduced in 2018, were chaptered into law.

Two themes that emerged from the Capitol this year were the continuing influence of the moderate Democrats, especially in the Assembly, and the fiscal restraint exercised by Governor Brown.

DISCUSSION

The Air District's primary legislative goal for 2018 was to secure funding to implement AB 617. This was particularly challenging, since the Department of Finance and key leadership staff in the Assembly tried to block our efforts to secure funding throughout the year. Their argument essentially was that air districts should recover all costs for AB 617 implementation through fees on industry. While that was and remains both legally impossible and impractical, Finance especially is likely to continue to assert their position in 2019.

However, staff orchestrated a campaign spearheaded by Assemblymember Tim Grayson (joined by 49 other members of the Legislature) that ultimately resulted in a \$50 million statewide allocation as part of the budget process. This was part of the cap-and-trade expenditure plan, and there was commitment by the 2018 Legislature and staff that this same level of funding should continue in 2019. However, items in the 2019 budget cannot be decided in advance, so more work will be required in the upcoming year to try to yet again secure funding for the major ongoing workload required by AB 617.

Another key budget issue for the Air District (District) were the statewide allocations of a substantial \$245 million for incentive programs in AB 617 communities, and a paltry \$3 million for woodsmoke incentive programs. Both of these allocations are also from the Greenhouse Gas Revenue Fund (GGRF), part of the cap-and-trade expenditure plan. The District was also part of a California Air Pollution Control Officers Association (CAPCOA)-led coalition that successfully blocked a Department of Finance proposal to grab Moyer revenues from tire fees (\$26 million annually) and divert it to the Department of Fish and Wildlife. Finance suggested that the Moyer program be backfilled with GGRF revenues. Because demand for GGRF funds exceeds their supply, and we would have had to have fought for the backfill every year, this raid on the Moyer program would have been highly detrimental to our incentive programs. The Finance proposal ultimately was successfully opposed by a diverse coalition of environmental and industry groups, organized by CAPCOA.

Outside of the budget arena, the District's track record on bills in 2018 was generally positive, although several measures we supported failed to advance. None of the bills the District opposed became law, including measures to exempt certain equipment from air quality regulations, to direct certain GGRF funding only to extreme ozone non-attainment areas, and to repeal 2017's transportation funding package. We successfully worked with the Bay Area's Assemblymember Kansen Chu and Senator Bill Dodd to have their bills AB 1975 and SB 1144 amended into bills we could support. These bills respectively addressed odor issues in Milpitas and environs, and civil air penalty ceilings for serious stationary source violations at refineries and other facilities. Ultimately, opposition to both bills was quite strong. Assemblymember Chu's AB 1975 died on the Assembly Floor. Senator Dodd's SB 1144 was not even heard in its first policy committee before the author amended the bill to address unrelated issues.

AB 2061, which we supported, is now law. Authored by Assemblymember Jim Frazier, it increases weight limits for clean trucks. Also, AB 1796, authored by Assemblymember Al Muratsuchi and supported by the District, is now law. It prevents landlords of rent-controlled buildings from blocking installation of tenant-funded electric vehicle charging stations. A number of other measures the District supported failed to advance, including bills on congestion pricing demonstrations, HOV lane enforcement, and exempting Moyer grants from taxes.

The Bill Discussion List (Attachment 4A) gives outcomes for 85 of the more significant bills with air quality implications.

BUDGET CONSIDERATION/FINANCIAL IMPACT

None.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Tom Addison

Attachment 4A: Bill Discussion List

LEGISLATIVE COMMITTEE
MEETING OF 12/17/2018

BAAQMD BILL DISCUSSION LIST

December 3, 2018

BILL NO.	AUTHOR	SUBJECT	STATUS	POSITION
AB 1745	Ting	Generally requires that by 2040, new vehicles be ZEVs	Dead	
AB 1756	Brough	Repeals SB1 (transportation funding measure of 2017)	Dead	Oppose
AB 1796	Muratsuchi	Adds EV charging station installation in rent-controlled buildings	Chaptered	Support
AB 1866	Fong	Traffic Relief and Road Improvement Act	Dead	
AB 1933	Maienschein	Revises CalRecycle organics programs to include food diversion and recovery	Chaptered	
AB 1945	E. Garcia	Changed GGRF grant funding guidelines to count daytime population in San Diego and Imperial Counties, and boost score for AB 617 communities	Vetoed	
AB 1975	Chu	Establishes South Bay Interagency Odor Taskforce	Dead	Support if amended
AB 1981	Limon	Includes CalFire in state efforts to increase composting and reduce organics	Chaptered	
AB 2006	Eggman	Agricultural Worker Clean Transportation Investment Program	Chaptered	
AB 2008	Salas	Excludes Moyer grants from taxable income	Dead	Support
AB 2061	Frazier	Increases truck weight limits for electric, fuel cell, or natural gas trucks	Chaptered	Support
AB 2091	Grayson	Promotes efforts to cut costs of prescribed burning	Chaptered	
AB 2120	Quirk	ARB to report on emissions trade-offs between wildfire and prescribed burning	Dead	
AB 2127	Ting	Directs CEC to do statewide assessment of EV charging infrastructure needs	Chaptered	
AB 2145	Reyes	Modifies and updates the Clean Truck, Bus, and Off-Road Vehicle and Equipment Program	Chaptered	
AB 2195	Chau	Requires ARB to quantify GHG impacts of out-of-state natural gas use in CA	Chaptered	
AB 2268	Reyes	Vehicle license fee changes	Dead	
AB 2321	McCarty	Solid waste management spot bill	Dead	
AB 2336	Salas	Requires ARB to prioritize schoolbus cleanup in San Joaquin and South Coast	Dead	
AB 2346	Quirk	Requires CPUC tracking of wildfire costs	Vetoed	
AB 2365	Acosta	Exempts crane owners from air quality regulations	Dead	

AB 2377	Irwin	Establishes technical assistance grant program for Healthy Soils Program	Chaptered	
AB 2378	Salas	ARB to quantify public health impacts of GGRF-funded programs	Dead	
AB 2381	Carrillo	ARB to increase emissions testing of new vehicles and impose fees on manufacturers to cover the costs of this program	Chaptered	
AB 2407	Ting	Research group to develop policy for recycling vehicle lithium-ion batteries	Dead	
AB 2434	Bloom	Creates Health in All Policies taskforce at Strategic Growth Council	Dead	
AB 2453	E. Garcia	Strong Climate and Pollution Resilience Act of 2018; focuses on air pollution mitigation for schools in disadvantaged communities	Chaptered	
AB 2492	Salas	Directs GGRF funding to pilot program for medium-duty trucks, only in extreme ozone non-attainment areas	Dead	Oppose
AB 2506	Burke	15% of state heavy-duty vehicle purchases to use renewable natural gas	Dead	
AB 2548	Friedman	Allows LA Metropolitan Transportation Authority to require employers of 50 or more to offer pre-tax transit option	Chaptered	
AB 2551	Wood	Forest and Wildland Health Improvement and Fire Prevention Program	Chaptered	
AB 2564	Rodriguez	New ARB penalty authority for illegal "glider" trucks (new truck bodies with non-compliant remanufactured engines)	Chaptered	
AB 2570	Nazarian	Clean and Healthy Schools Act; focused on improving indoor air quality by only allowing cleaning products free of harmful chemicals in schools	Dead	
AB 2572	Calderon	When air districts issue unhealthy air warnings, schoolchildren to be kept indoors	Dead	
AB 2585	Patterson	Addresses liability of landowners for prescribed burns conducted with permits	Dead	
AB 2636	E. Garcia	Creates Environmental Justice Fund, to be used by the AG to support EJ cases	Dead	
AB 2645	Patterson	Appropriates \$525M annually from GGRF to Dept. of Forestry for various programs including wildfire prevention	Dead	
AB 2672	Patterson	Requires ARB annual report comparing wildfire GHG emissions to reductions from regulatory programs	Dead	
AB 2809	Patterson	Defines large hydro facilities (those over 30 megawatts) as renewable per Renewable Portfolio Standard requirements	Dead	
AB 2814	Gray	Defines large hydro facilities (those over 30 megawatts) as renewable per Renewable Portfolio Standard requirements	Dead	
AB 2885	Rodriguez	Prioritizes Clean Vehicle Rebate Program incentives to the low income	Chaptered	
AB 2908	Berman	Various changes to tire fee laws paid on new tires	Vetoed	

AB 2940	Caballero	Exempts certain heavy-duty diesel low-use and agricultural vehicles from existing requirements that would prevent their registration	Dead	Oppose
AB 2951	Gloria	Spot bill on Bay Area Employer Commuter Benefit Program	Dead	
AB 3001	Bonta	California Zero-Emission Buildings Act	Dead	
AB 3015	Caballero	ARB to report on cost-effectiveness of clean cargo handling equipment	Dead	
AB 3020	Flora	CEQA exemption for actions to cut wildfire risk	Dead	
AB 3059	Bloom	Authorizes congestion pricing demonstration projects	Dead	Support
AB 3070	Carillo	Spot bill on AB 32 (greenhouse gas emission reduction program)	Dead	
AB 3107	Baker	Spot bill on vehicle emissions standards	Dead	
AB 3113	Fong	Spot bill on AB 32 (greenhouse gas emission reduction program)	Dead	
AB 3146	Holden	Requires hydrocarbon testing during remediation of old oil and gas wells	Dead	
AB 3156	Mullin	Specifies that any EV charging, including cordless charging, is subject to existing EV charging laws regarding public accessibility	Dead	
AB 3165	Friedman	Affects at what point the CEC can stop providing funding for hydrogen refueling	Dead	
AB 3201	Daly	Includes large-scale bus deployment as grant eligible in clean truck program	Dead	
AB 3232	Friedman	Sets goal of zero-energy new buildings by 2030, and 50% reduction in GHG emissions from existing buildings by 2030	Chapters	
SB 957	Lara	Increases time-period for HOV decal validity for low-income motorists	Chapters	
SB 980	Cannella	Spot bill on HOV lanes	Dead	
SB 985	Morrell	Spot bill on renewables portfolio standard	Dead	
SB 1000	Lara	Requires assessment of whether chargers are proportionally deployed; blocks local governments from restricting use of public charging by certain EV types	Chapters	
SB 1002	Nielsen	Safe Forests and Grasslands Act of 2018	Dead	
SB 1013	Lara	Codifies in state law US EPA controls on CFCs with high GHG impacts	Chapters	
SB 1014	Skinner	Requires CPUC to adopt a program to increase the use of ZEVs by ride-hailing companies such as Uber and Lyft	Chapters	
SB 1015	Allen	Establishes California Climate Resiliency Program, administered by Wildlife Conservation Board, using GGRF, with funds to CalEnviroScreen communities	Dead	

SB 1027	Pan	Requires adoption and tracking of GHG emission reduction targets for state agency employees or categories of employees	Dead	
SB 1035	Jackson	Requires local government general plan safety element updates to address fire and flood hazards and climate adaptation and resilience strategies	Chaptered	
SB 1072	Leyva	Provides GGRF funds to new Regional Climate Collaborative Programs, to assist under-resourced communities to get grants	Chaptered	
SB 1074	Moorlach	Requires gas stations to post all taxes and GHG compliance costs	Dead	
SB 1119	Beall	Changes to the GGRF-funded Low Carbon Transit Operations Program	Chaptered	
SB 1144	Dodd	Increases civil stationarily source air penalty ceilings for serious violations at powerplants, petrochemical facilities, and refineries	Dead	Support if amended
SB 1163	Galgiani	Initially exempted concrete trucks from air regulations; this was defeated. Signed bill on unrelated subject matter	Chaptered	
SB 1209	Leyva	Spot bill on AB 32 (greenhouse gas emission reduction program)	Dead	
SB 1330	Fuller	Toxic air contaminants spot bill	Dead	
SB 1347	Stern	Directs CPUC to adopt targets for energy storage by utilities	Dead	
SB 1377	Wilk	Spot bill on community air monitoring next to refineries	Dead	
SB 1380	Stern	Establishes Clean Energy Financing Clearinghouse	Dead	
SB 1399	Wiener	Affects PUC's net energy metering requirements	Dead	
SB 1401	Wieckowski	Office of Planning and Research required to seek feedback on their existing climate adaptation information clearinghouse	Dead	
SB 1427	Hill	States legislative intent to improve enforcement of HOV and HGT lanes; amended to unrelated subject matter	Dead	Support
SB 1434	Leyva	States legislative intent to affect electricity rates to increase alternative fuel medium- and heavy-duty ZEVs	Dead	
SB 1440	Hueso	CPUC to consider adopting biomethane procurement goals	Chaptered	
SB 1444	Stone	Spot bill on wildfires	Dead	
SB 1463	Moorlach	ARB required to include wildfire emissions in scoping plan	Dead	
SB 1477	Stern	Would require incentives for low-emission space and water heating technologies	Chaptered	
SB 1478	Leyva	Spot bill on AB 32 (greenhouse gas emission reduction program)	Dead	

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson Kim and Members
of the Legislative Committee

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 6, 2018

Re: Discussion of Potential 2019 Legislative Agenda

RECOMMENDED ACTION

The Committee will consider recommending a 2019 Legislative Agenda to the Board for adoption.

BACKGROUND

The new 2019-2020 Legislative session officially began on December 3, 2018, although little legislative activity occurs until January. Key dates for members are January 25, 2019 to submit potential bills to Legislative Counsel, and February 22, 2019 is the deadline to bill introductions.

DISCUSSION

In considering a potential legislative agenda for 2019, some topics the Committee may wish to consider include recent smoke exposures in the region, funding needs for implementing Assembly Bill 617 (AB 617), and potential responses to any legislation involving the composition of the Board. Outlined below are a few of the potential topics.

Recent Smoke Exposures in the Region

November saw record levels of fine particulates throughout the Bay Area and beyond, as smoke from the catastrophic Camp fire in Butte County drastically affected air quality. While the Air District (District) was highly visible sharing information about exposures and strategies to reduce exposures, there is not a centralized or publicized network of indoor spaces protected with filtration systems where residents might congregate during future such episodes. Having a publicized network of public spaces where residents could congregate indoors could be a significant benefit for public health. Potential legislation might both call for the establishment of such a network and simultaneously for funding to provide the systems necessary to ensure that the air in such buildings is clean. Improved particulate air filters are one way to effectively remove particulates from outside air, but N-95 particulate masks might also be available at such facilities during acute future episodes.

Funding Needs for Implementing AB 617

The 2017 passage of AB 617 as part of the extension of California's cap-and-trade program has imposed multiple requirements upon the District and is well underway as part of the Community Health Protection Program in the Bay Area. Some of the more prominent aspects include the development and installation of new community air monitoring programs, implementation of comprehensive community emission reduction plans, and significant new work regarding Best Available Retrofit Control Technology (BARCT). In 2018, the District worked collaboratively with a variety of partners to secure \$50 million in statewide funding for AB 617 implementation, with a commitment from members and staffers in both houses that this amount should also be appropriated in 2019.

However, as the number of designated communities increases, and the scope of work in these communities expands, it is critical that the District secure and expand upon prior funding, to ensure the program achieves its public health goals. Of the \$50 million statewide allocation for 2018, the District is slated to receive \$12 million. Securing funding that is both ongoing and adequate to implement our community programs in a way that heavily impacted communities deserve could be part of the District's 2019 legislative agenda.

Responses to Legislation Involving the Composition of the Board

There may be legislative proposals that could affect the composition of this Board. Last year, the Board opposed any legislation regarding the composition of this Air District's Board of Directors that did not originate with the Board but was instead proposed by others. Ultimately, in 2018 no such proposals were submitted as bills, in part because staff articulated the District position to a variety of interest groups and legislators. However, staff believe that one or two such proposals may be introduced in 2019, and suggest the Board consider retaining its previous position.

BUDGET CONSIDERATION/FINANCIAL IMPACT

None.

Respectfully submitted

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Tom Addison

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 5, 2018

Re: Public Hearing to Consider Adoption of Assembly Bill (AB) 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule, and Certification of a Final Environmental Impact Report (EIR) Pursuant to the California Environmental Quality Act (CEQA)

RECOMMENDED ACTION

Staff recommends that the Board of Directors take the following actions:

1. Adoption of proposed AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule; and
2. Certification of a Final Environmental Impact Report pursuant to the California Environmental Quality Act (CEQA).

DISCUSSION

Assembly Bill 617, approved July 26, 2017, amends California Health and Safety Code section 40920.6, et seq. and requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) on specified facilities by the earliest feasible date, but no later than December 31, 2023. Local air districts are required to adopt this schedule before January 1, 2019. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. The overall purpose of BARCT implementation is to reduce criteria pollutant emissions from significant industrial sources that currently participate in the GHG Cap and-Trade system.

In developing the Expedited BARCT Implementation Schedule, Air District staff reviewed the status of BARCT implementation for all source categories at affected facilities and, as a result of that review, proposes six potential rule development projects aimed at addressing emissions from: 1) organic liquid storage tanks; 2) petroleum wastewater treating; 3) Portland cement manufacturing; 4) refinery fluid catalytic crackers and carbon monoxide gas boilers; 5) refinery heavy liquid leaks; and 6) petroleum coke calcining.

Staff prepared a CEQA Initial Study and Environmental Impact Report (EIR) for adoption of the Expedited BARCT Implementation schedule. The draft EIR for the Expedited BARCT Implementation Schedule concluded that air quality impacts associated with the construction of air pollution control equipment would be potentially significant after mitigation and cumulatively considerable. Water demand impacts from the operation of air pollution control equipment were found to be potentially significant after mitigation and cumulatively considerable. Mitigation measures are required for air quality impacts from construction activities and water demand impacts from operation of air pollution control equipment.

SCHEDULE DEVELOPMENT PROCESS

In developing the proposed Expedited BARCT Implementation Schedule, staff has been soliciting public comments and conducting stakeholder outreach since May 2018. Staff published the concept paper, Initial Staff Report, Staff Report, and rule development project scope papers for the Expedited BARCT Implementation Schedule and accepted public comments on these materials. Input received during these outreach efforts, along with further investigation and analysis by staff, were used to develop the final implementation schedule for consideration by the Air District's Board of Directors. Throughout the outreach process for the development of the schedule, Air District staff also engaged in additional early outreach with stakeholders for individual rule development projects and will continue those efforts as those projects progress.

Air District staff posted the CEQA Notice of Preparation / Initial Study of environmental impacts on August 7, 2018 for public comment and conducted a CEQA Scoping Meeting on August 24, 2018 at the Air District's offices. The draft EIR was posted on October 23, 2018 for public review and comment.

Note that each individual rule development project will still follow the Air District's standard rule development process. As described in the schedule, rule development activity is anticipated to occur throughout the period from 2018 to 2021.

BUDGET CONSIDERATIONS/FINANCIAL IMPACTS

Provisions in the schedule will have minor impacts on Rule Development, Engineering, Meteorology and Measurements, and Compliance and Enforcement. In each case, the organization will fit small intermittent increases in work into existing workload priorities. No increase in personnel or costs is anticipated.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: David Joe
Reviewed by: Victor Douglas

Attachment 12A: Final Staff Report for the Expedited BARCT Implementation Schedule

Attachment 12B: Comments and Responses on Staff Report and Proposed Schedule

Attachment 12C: Final Environmental Impact Report for the Expedited BARCT
Implementation Schedule

Attachment 12D: Board Resolution – Adopting Expedited BARCT Implementation Schedule
and Certifying a CEQA Environmental Impact Report for the Project

Bay Area Air Quality Management District
375 Beale Street
San Francisco, CA 94105

Assembly Bill 617
Industrial Cap-and-Trade Sources
Expedited BARCT Implementation Schedule



FINAL STAFF REPORT
December 2018

Prepared by:
Guy Gimlen – Principal Air Quality Engineer
David Joe, P.E. – Principal Air Quality Engineer
Steve Maltby, P.E. – Senior Air Quality Engineer

ACKNOWLEDGEMENTS

The following people contributed to development this Staff Report for an Expedited BARCT Implementation Schedule that meets the requirements of Assembly Bill 617. Each deserves recognition for their important contributions.

Brian Bunger, Esq. – Legal

Todd Gonsalves, Esq. – Legal

Jeff Gove – Compliance & Enforcement

Pam Leong – Engineering

Jerry Bovee – Meteorology & Measurements

Victor Douglas – Community Engagement & Policy

Laura Cackette – Community Engagement & Policy

David Holstius – Assessment, Inventory and Modeling

Aneesh Rana – Community Engagement & Policy

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ATTACHMENT A: Scope Papers for Potential Rule Development Projects in Expedited BARCT Implementation Schedule

ATTACHMENT B: Proposed AB 617 Expedited BARCT Implementation Schedule

ATTACHMENT C: Additional Source Categories for Further Study and Consideration with Local Community Emission Reduction Plans

I. EXECUTIVE SUMMARY

Assembly Bill 617 (AB 617), approved July 26, 2017, amends California Health and Safety Code section 40920.6 et seq. and requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) on specified facilities by the earliest feasible date, but no later than December 31, 2023. Local air districts are required to adopt this schedule before January 1, 2019. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. The schedule must give priority to any sources that have not had emissions limits modified for the greatest period of time. The schedule does not apply to sources that have implemented BARCT since 2007.

The overall purpose of BARCT implementation is to reduce criteria pollutant emissions from significant industrial sources that currently participate in the GHG Cap-and-Trade system. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria and toxic pollutants may impact local communities that are already suffering a disproportionately higher burden from air pollution.

The Bay Area Air Quality Management District (Air District) is proposing an Expedited BARCT Implementation Schedule to meet the requirements of AB 617. Staff conducted background research and analysis to identify pollutants of concern and affected sources, conduct preliminary BARCT evaluations, and identify and prioritize potential BARCT rule development projects. The schedule includes six potential rule development projects, each of which is listed in Table ES-1, along with estimates of potential emission reductions and cost effectiveness where available.

Table ES-1: Rule Development Projects with Potential Emission Reductions and Cost Effectiveness

Rule Development Projects		Potential Emission Reductions (tpy) ¹	Cost Effectiveness (\$/ton) ²
1	Rule 8-5: Organic Liquid Storage Tanks	ROG: 75 to 125 tpy	ROG: \$10,000 to \$20,000
2	Rule 8-8: Petroleum Wastewater Treating	ROG: Unknown	ROG: Unknown
3	Rule 9-13: Portland Cement Manufacturing	PM: Unknown SO ₂ : 698 tpy	PM: Unknown SO ₂ : \$2,100
4	Rule 6-5: Refinery Fluid Catalytic Crackers and CO Boilers	PM: Unknown SO ₂ : 567 tpy	PM: Unknown SO ₂ : \$4,000 to \$47,000
5	Rule 8-18: Refinery Heavy Liquids Leaks	ROG: Unknown	ROG: Unknown
6	Rule 9-14: Petroleum Coke Calcining Operations	NOx: Unknown	NOx: Unknown

¹ More detailed information and further discussion on potential emission reductions for the rule development projects can be found in the individual project scopes in Attachment A.

² More detailed information and further discussion on costs and cost effectiveness for the rule development projects can be found in the individual project scopes in Attachment A.

Rule development activity for the projects listed in the schedule will follow the standard rule development process, and is anticipated to occur throughout the period from 2018 to 2021.

An analysis of the potential environmental impacts of the proposed Expedited BARCT Implementation Schedule was conducted pursuant to the California Environmental Quality Act (CEQA). The Environmental Impact Report concluded that the project may result in potential significant impacts in the following resources areas: Air Quality and Water Resources.

Staff recommends the Board of Directors adopt the proposed Expedited BARCT Implementation Schedule and certify the associated CEQA Environmental Impact Report at the Public Hearing scheduled for December 2018.

II. BACKGROUND

Regulatory framework

California's air quality programs have significantly improved public health through statewide and regional air quality planning requirements, advancement of technology-based solutions, and risk reduction efforts. However, certain communities continue to experience a disproportionately higher burden from air pollution, including communities near ports, rail yards, warehouses, and freeways and areas with high concentrations of industrial facilities. AB 617 requires new community-focused and community-driven action to reduce air pollution and improve public health in communities that experience disproportionately higher burdens from exposure to air pollutants. AB 617 directs air districts to apply BARCT to all industrial sources subject to Cap-and-Trade, and to identify communities with a "high cumulative exposure burden" to air pollution. Districts must then prioritize these communities for community air monitoring projects and/or emission reduction programs, which must be developed through a community-based process. Implementing and updating BARCT controls at industrial sources should also provide some emission reductions for these community programs.

The Air District 2017 Clean Air Plan includes a long-range goal to eliminate disparities in air pollution exposure in the San Francisco Bay Area. The Air District has been explicitly working towards this goal since 2006, with the initiation of the Community Air Risk Evaluation (CARE) program. The CARE program identifies and assists communities that have higher air pollution levels and may experience more air pollution-related health impacts. Emissions from mobile sources, small and large stationary sources, and goods-movement related indirect sources can have localized impacts on pollution levels or contribute to cumulative levels of pollution that are experienced by nearby communities. The CARE program provides a framework for the Air District to target its incentive and enforcement efforts in the most impacted communities. However, many communities remain overburdened and there is more that must be learned and done. The Air District, through a partnership with local communities and the state, has an opportunity to better understand local air pollution, its sources, and impacts, and to develop strategies to better reduce people's exposure to air pollution.

AB 617 Overview

AB 617 requires the following:

- Air districts in nonattainment areas must implement BARCT on all industrial sources subject to the AB 32 Cap-and-Trade Program (the subject of this Staff Report).
- The California Air Resources Board (CARB) must establish and maintain a clearinghouse of best available control technology (BACT), and best available retrofit control technology (BARCT).
- Maximum penalties for air pollution violations are increased and will adjust with inflation.
- CARB must prepare an air monitoring plan for all areas of the state by October 1, 2018.

- Based on air monitoring plan information, CARB must select communities with high cumulative exposure burden from both toxic and criteria air pollutants by July 1, 2019.
 - Each air district with a high cumulative burden community must deploy a community air monitoring system in that community within one year of selection and provide the air quality data to CARB for publication.
- By January 1, 2020, and each January 1 thereafter, CARB will select additional communities with high cumulative exposure burden.
 - Each air district with a high burden community must deploy a community air monitoring system in that community within one year of selection and provide the air quality data to CARB for publication.
- CARB must prepare a state-wide strategy to reduce emissions of toxic and criteria pollutants in communities affected by high cumulative exposure burden, by October 1, 2018, and update the strategy every five years. The state-wide strategy must include:
 - A methodology for assessing and identifying contributing sources and estimating their relative contribution to elevated exposure (source apportionment);
 - An assessment of whether an air district should update and implement the risk reduction audit and emissions reduction plan for any facility if the facility causes or significantly contributes to the high cumulative exposure burden;
 - An assessment of available measures for reducing emissions including BACT, BARCT, and best available control technology for toxics (TBACT); and
 - A priority on disadvantaged communities and sensitive receptor locations.
- CARB will select locations for preparation of Community Emission Reduction Plans by October 1, 2018. CARB will select additional locations annually thereafter.
 - Within one year of selection, the air district will adopt Community Emission Reduction Plans in consultation with CARB, individuals, community-based organizations, affected sources, and local governmental bodies.
 - The Community Emission Reduction Plans must be consistent with the state-wide strategy, and include emission reduction targets, specific reduction measures, a schedule for implementation of the measures, and an enforcement plan.
 - The Community Emission Reduction Plans must be submitted to CARB for review and approval.
 - CARB must initiate a public process to achieve an approvable Community Emission Reduction Plan if the Plan is initially not approvable.
 - CARB must develop and implement applicable mobile source elements in the Community Emission Reduction Plans to achieve emission reductions.
 - The Community Emission Reduction Plans must achieve emission reductions in the community, based on monitoring or other data.

- The air district must prepare an annual report summarizing the results and actions taken to further reduce emissions.
- CARB will provide grants to community-based organizations for technical assistance and to support community participation in the identification of communities with high exposure burden, and development and implementation of the Community Emission Reduction Plans.

AB 617 represents a significant enhancement to the approach that CARB and local air districts take in addressing local air quality issues. The Air District has implemented and established a number of programs that support the goals and intent of AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics “Hot Spots” Program, and Air District Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, the requirements of AB 617 formalize new programs and establish challenging goals and timelines for implementation.

AB 617 Expedited BARCT Implementation Schedule Requirements

AB 617 requires each air district that is in nonattainment for one or more air pollutants to adopt an expedited schedule for implementation of BARCT by the earliest feasible date, but no later than December 31, 2023. The expedited schedule must be adopted no later than January 1, 2019. The BARCT requirements apply to each industrial source subject to California GHG Cap-and-Trade requirements. The schedule must give priority to any sources that have not had emissions limits modified for the greatest period of time and does not apply to sources that have implemented BARCT since 2007. When developing and adopting an expedited schedule, air districts should take into account the local public health and clean air benefits to the community, cost effectiveness of control options, and air quality and attainment benefits of control options.

BARCT is defined in the California Health and Safety Code as an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source.³ The Air District typically determines BARCT during the rulemaking process for a given source category on a pollutant-by-pollutant basis, and develops and adopts rules reflecting BARCT. AB 617 does not expand or limit the Air District’s ability to adopt or amend rules; but it does set a requirement for developing an expedited schedule for rule development and places a priority on adopting rules requiring BARCT implementation on sources at industrial Cap-and-Trade facilities.

Technical review

Air District staff conducted a review of all affected industrial sources and developed preliminary BARCT evaluations to determine which sources are appropriate for rule

³ California Health and Safety Code § 40406.

development. Staff's process for identifying potential BARCT rule development projects and developing the expedited schedule involved:

- Identifying pollutants of concern and affected facilities and sources
- Identifying sources subject to the expedited schedule requirements and sources with the greatest potential BARCT emission reductions
- Conducting preliminary BARCT evaluations
- Identifying and prioritizing potential BARCT rule projects

Pollutants of Concern

The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead. The air basin is designated as nonattainment for ozone (O₃) and particulate matter (PM_{2.5} and PM₁₀) California Ambient Air Quality Standards;^{4,5} therefore, the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NO_x)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM₁₀)
- Particulate Matter less than 2.5 microns (PM_{2.5})
- Sulfur Dioxide (SO₂).

Note that NO_x and ROG are included because they are precursors for ozone formation. SO₂ may contribute to the formation of condensable PM (i.e. formed in the emissions plume from the stack) at certain types of sources, so PM control strategies may include SO₂ limits. Preliminary studies and testing indicate that these condensable PM emissions may be substantial, therefore SO₂ sources that are likely to form condensable PM are included in this BARCT determination study. Sulfur dioxide can also be a precursor for secondary PM (i.e. ammonium sulfate formed in the atmosphere through reactions with ambient ammonia); however, these secondary PM impacts from SO₂ may not be a significant contributor to exceedances of PM ambient air quality standards. Therefore, SO₂ sources that do not have condensable PM potential are not included in this BARCT review and evaluation study at this time.

Affected Facilities and Sources

A list of facilities that are subject to Cap-and-Trade, including sources and emissions, was developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities that are subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. AB 617 requires that the expedited schedule for BARCT implementation apply to each industrial source subject to the Cap-and-Trade program. The

⁴ United States Environmental Protection Agency (EPA), 2018a. Eight-Hour Ozone (2015) Nonattainment Areas by State/County/Area. Data is current as of September 30, 2018.

<https://www3.epa.gov/airquality/greenbook/jncty.html>

⁵ United States Environmental Protection Agency (EPA), 2018b. PM-2.5 (2006) Designated Area Area/State/County Report, Data is current as of September 30, 2018.

https://www3.epa.gov/airquality/greenbook/rbca.html#PM-2.5.2006.San_Francisco

term “industrial source” is not explicitly defined in the AB 617 language, however the Cap-and-Trade program does include particular provisions that refer to “industrial sectors”, “industrial covered entities”, “industry assistance”, and “industrial facilities.”⁶ These provisions relate the term “industrial” to certain covered entities or facilities that are eligible for free allowance allocation under the Cap-and-Trade program.⁷ Under the Cap-and-Trade program, these free allowance allocations are provided to certain industrial sectors to minimize potential leakage of economic activity and emissions.⁸ The usage of the term “industrial sources” in the AB 617 language has subsequently been clarified by CARB staff,⁹ and is understood to be consistent with the usage of the term “industrial” in the Cap-and-Trade program. CARB provided a list of these “industrial” facilities that includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation.¹⁰ The list excludes opt-in covered entities,¹¹ and any industrial sources that became subject to the Program after January 1, 2017. This screening for “industrial sources” reduces the number of affected facilities to 19 industrial Cap-and-Trade facilities, which encompass 1,899 individual sources in 50 source categories.

Source Screenings

Staff performed pollutant-by-pollutant screenings on this population of potentially affected sources to determine which sources and source categories required further BARCT evaluation. Staff initially identified and included sources where potential emission reductions from additional controls may be cost effective. Controls that are not cost effective would not meet the criteria to be considered BARCT. In such cases, the source would already be considered to be implementing and achieving BARCT, and therefore no further BARCT controls would be required. Staff identified and included sources that emit more than 10 pounds per day of a given pollutant (1.8 tons per year). This level of emissions is consistent with the Air District’s threshold for new sources required to install best available control technology (BACT) per Rule 2-2: New Source Review, Section 2-2-301. Given that sources below this threshold would have relatively low annual emissions, potential emissions reductions at these sources would be small and are not likely to be cost effective. This approach reduced the population of sources as shown in Table 1.

⁶ 17 CCR §§ 95870, 95890, and 95891.

⁷ 17 CCR §§ 95870(e) and 95891(a).

⁸ “Leakage” refers to potential production shifts away from a jurisdiction due to increased compliance costs and prices. The reduction in production and emissions in the implementing jurisdiction may be offset by increased production and emissions elsewhere.

⁹ Email correspondence between K. Magliano, CARB and A. Abbs, CAPCOA, “BARCT List.” June 18, 2018.

¹⁰ 17 CCR § 95890(a).

¹¹ 17 CCR § 95802(a)(259).

Table 1: AB 617 BARCT Initial Screening Results for Affected Industrial Sources

Pollutant	Number of Source Categories	Number and Percentage of Sources¹²	Amount and Percentage of Emissions¹³
NO _x	24	214 / 41%	5,722 tpy / 98%
ROG	23	259 / 16%	4,430 tpy / 93%
PM	17	126 / 16%	1,857 tpy / 92%
SO ₂	16	104 / 19%	5,043 tpy / 98%

As shown in Table 1, the resulting population of sources accounts for a large majority of the total emissions at affected industrial Cap-and-Trade facilities (92 to 98 percent). These results also indicate that the low emitting sources, while numerous, account for only a small percentage of the total emissions at affected industrial Cap-and-Trade facilities. Given the relatively small total emissions from the low emitting sources, additional controls on these sources would have limited potential to achieve substantial emission reductions and effectively provide meaningful air quality and attainment benefits. As discussed previously, additional controls on low emitting sources are also not likely to be cost-effective, and therefore would not be anticipated to meet the criteria to be considered BARCT.

Staff then selected sources where BARCT has not already been applied for each nonattainment pollutant. Per AB 617, the requirements for an expedited BARCT schedule do not apply to sources where BARCT implementation has occurred since 2007. Regulations with emission limits that have been amended and/or adopted since 2007 are generally considered to reflect current BARCT levels for that pollutant, and sources subject to these limits are therefore already assumed to meet BARCT for those nonattainment pollutants. In such cases, no further BARCT determination or rulemaking is required for the expedited schedule. After selecting sources where BARCT has not already been achieved for the given pollutant, the population of sources was reduced as shown in Table 2.

¹² Percentage values shown indicate the percentage relative to the total number of sources at affected industrial Cap-and-Trade facilities

¹³ Percentage values shown indicate the percentage relative to the total emissions at affected industrial Cap-and-Trade facilities

Table 2: AB 617 BARCT Final Screening Results for Affected Industrial Sources

Pollutant	Number of Source Categories	Number and Percentage of Sources¹⁴	Amount and Percentage of Emissions¹⁵
NO _x	21	73 / 34%	1,764 tpy / 30%
ROG	23	259 / 16%	4,430 tpy / 93%
PM	16	124 / 15%	1,851 tpy / 92%
SO ₂	15	102 / 19%	3,651 tpy / 71%

These sources and source categories require further evaluation and BARCT determination.

BARCT Determination Process

Staff reviewed available information on current achievable emission limits and potential controls for each source category and each nonattainment pollutant. This information included guidelines and recent determinations of BACT, reasonably available control technology (RACT), and lowest achievable emission rate (LAER) from EPA, CARB, and other air districts. Staff determined:

- Current levels of BACT/RACT/LAER controls and emissions (and next more stringent levels of BACT/RACT/LAER controls, if available);
- Potential emission reductions (and incremental additional potential emission reductions, if available); and
- Estimated capital and annual costs for retrofit of controls to existing facilities.

Preliminary estimates of cost effectiveness (and incremental cost effectiveness, where appropriate) were calculated, and any controls and emission limits with a cost effectiveness within reasonable bounds, consistent with recent BARCT determinations, were considered for potential rule development projects. Additional information on the estimates of emissions reductions and control costs can be found in Section IV and in the project scopes included in Attachment A.

Based on these preliminary BARCT determinations, staff proposes six potential high priority rule development projects for inclusion in the Expedited BARCT Implementation Schedule. Criteria for the selection and prioritization of these six projects include:

- Potential for localized clean air and public health benefits through reduction of localized exposure to harmful pollutants, including potential toxic emission reduction co-benefits;
- Potential for substantial emissions reductions (greater than ten tons per year), with a focused consideration of potential PM emissions reductions for reducing localized PM health impacts;
- Prioritization of source categories where BARCT rules have not been adopted or evaluated for the greatest period of time; and
- Cost effectiveness of potential rule development project controls.

¹⁴ Percentage values shown indicate the percentage relative to the total number of sources at affected industrial Cap-and-Trade facilities

¹⁵ Percentage values shown indicate the percentage relative to the total emissions at affected industrial Cap-and-Trade facilities

High priority potential rule development projects are shown in Table 3. Project scope descriptions for each of these projects are included in Attachment A.

Table 3: Potential Rule Development Projects

Rule Development Projects	PM	NO_x	ROG	SO₂
1 Organic Liquid Storage Tanks (Rule 8-5)			X	
2 Petroleum Wastewater Treating (Rule 8-8)			X	
3 Portland Cement Manufacturing (Rule 9-13)	X			X
4 Refinery Fluid Catalytic Crackers and CO Boilers (Rule 6-5)	X			X
5 Refinery Heavy Liquid Leaks (Rule 8-18)			X	
6 Petroleum Coke Calcining (Rule 9-14)		X		

Through this BARCT evaluation and review process, staff also identified 12 additional source categories for further study and consideration, as shown in Attachment C. Based on the preliminary review process, staff believes that there is limited potential to apply additional BARCT controls and achieve substantial reductions at these sources. Staff identified a number of factors that may limit the potential emissions reductions and efficacy of further controls at these sources:

- Potential emissions reductions are relatively small;
- Estimates of emissions and emissions reductions may be uncertain and require further study;
- Control options may not be technologically feasible or may not be suitable for retrofit; and
- Many control options identified may not meet BARCT cost effectiveness requirements.

Additionally, further controls on these sources may have limited potential to effectively impact localized exposures in communities and attainment of ambient air quality standards. Based on the limited potential for substantial controls and emissions reductions, staff does not recommend that these potential rule projects be included as priority rule development projects in the Expedited BARCT Implementation Schedule at this time. Staff believes that these projects merit further study, and actions on these source categories may be more appropriately considered during development of local Community Emission Reduction Plans. Staff anticipates that further evaluation and study during the AB 617 community-based monitoring, modeling, and planning activities, will inform future potential actions for these source categories. Further information on these 12 additional source categories can be found in Attachment C.

III. PROPOSED EXPEDITED BARCT IMPLEMENTATION SCHEDULE

Rule Development Project Schedules

Figure 1 shows the estimated schedule for each of the six potential rule development projects. This schedule is also included in Attachment B. This schedule assumes the Air District rule development group operates at full staffing, with various phases of the different rule development process occurring in parallel over four consecutive years. Note that staff anticipates that these projects would be developed along with other rule development projects outside of the Expedited BARCT Implementation Schedule, including rules currently being developed as part of the 2017 Clean Air Plan implementation.

Figure 1: Expedited BARCT Implementation Schedule

Project	2018	2019	2020	2021
Rule 8-5: Organic Liquid Storage Tanks				
Rule 8-8: Petroleum Wastewater Treating				
Rule 9-13: Portland Cement Manufacturing				
Rule 6-5: Refinery Fluid Catalytic Crackers and CO Boilers				
Rule 8-18: Refinery Heavy Liquids Leaks				
Rule 9-14: Petroleum Coke Calcining Operations				

Rule Development Project Timelines

Most rule development projects take approximately 12 months from initiation to rule adoption at a Public Hearing. Staff assumes the first nine months of a project require a full-time staff person to perform and coordinate regulatory development activities, which may include:

- Establishing scope with internal workgroup
- Identifying all affected sources
- Verifying and refining emissions estimates
- Completing research on possible controls
- Refining estimates of emission reductions
- Confirming and refining capital and annual cost estimates
- Determining cost effectiveness (and incremental cost effectiveness, if applicable)
- Working with and gathering input from affected parties
- Drafting rule language and workshop report
- Reviewing/revising workshop documents
- Conducting workshops
- Initiating California Environmental Quality Act (CEQA) and Socioeconomic Analyses
- Receiving and incorporating comments from workshops into final documents
- Reviewing CEQA and Socioeconomic Analyses
- Finalizing Public Hearing documents

Staff assumes the remaining three months of the project require about half-time staff person to complete the public hearing, assist in implementation, and submit proper documentation to CARB.

Staff recognizes that some rule development projects may take more time during the technical assessment phase, especially if emission estimates from various sources are inconsistent, or additional source testing or emissions profile testing is required. This information gathering phase can extend a project timeline from six to 12 months. As shown in the Expedited BARCT Implementation Schedule in Figure 1, staff anticipates that additional emissions information gathering and/or testing will be required for rule development projects regarding Organic Liquid Storage Tanks, Petroleum Wastewater Treating, Cement Manufacturing, and Refinery Fluid Catalytic Crackers and CO Boilers. Further information on additional data collection and other testing considerations for each rule development project can be found in the project scope descriptions in Attachment A.

IV. EMISSION REDUCTION BENEFITS & COMPLIANCE COSTS

This section of the Staff Report summarizes the methods used to estimate emission reductions that can occur when applying BARCT to sources emitting nonattainment pollutants. More detailed information on the current emissions, potential emission limits, emission reductions, and costs and cost effectiveness for each specific priority rule development project can be found in the project scopes in Attachment A.

Current Emissions

Current emissions are based on Reporting Year 2016 Emissions Inventory reported to CARB by August 1, 2017. These emissions are based on operating year 2015 for most facilities.

Potential Emission Limits

As described in Section II, staff reviewed available information on current achievable emission limits and potential controls for each source category and each nonattainment pollutant. This information included guidelines and recent determinations of best available control technology (BACT), reasonably available control technology (RACT), and lowest achievable emission rate (LAER) from EPA, CARB, and other air districts. These determinations often provide limits in the form of emission factors (e.g., mass of pollutant emitted per unit of input or per unit of output) and describe the type of controls typically required to achieve the stated emission limit. Where there is a wide array of emission limits for a given control technique, staff typically used the average level of control achieved, leading to somewhat conservative estimates for potential emission reductions.

This BACT/RACT/LAER information is available in the EPA clearinghouse, CARB clearinghouse, or through BACT determinations available from California air districts. Note that the Air District has been coordinating and collaborating with CARB and other California air districts to support CARB's efforts to improve availability and access of this information.

Emission Reduction Estimates

Staff estimated potential emission reductions based on the current performance of the affected sources and the potential limit or level of control identified in the preliminary BARCT review. Current performance of the affected sources was based on Air District 2016 Reporting Year emissions, as well as other additional supplemental information available. The difference between the current performance and the preliminary BARCT level identified was used to calculate potential emission reductions from BARCT implementation. Priority rule development projects included in the Expedited BARCT Implementation Schedule were identified to have potential emission reductions greater than 10 tons per year (tpy) and provide a significant opportunity for emission reductions and public health benefits. Estimates of potential emission reductions for the rule development projects (where available) are shown in Table 4. More detailed information and further discussion on potential emission reductions for the rule development projects can be found in the individual project scopes available in Attachment A.

Capital and Operating Cost Estimates

Staff estimated control costs using a variety of sources. Costs of controls are most often obtained from the EPA Cost Models,¹⁶ readily available on the EPA website. Control cost data are also available from cost studies performed and published by EPA, CARB, or other air districts, often as part of the evaluation and analysis of regulations, rules, and engineering determinations. Control equipment vendors and affected industries may also generate estimates for control costs. These estimates may need to be adjusted to account for cost uncertainties, as well as differences and changes in market conditions. Although these studies and cost estimates are often updated regularly, cost estimates may sometimes need to be reassessed to reflect today's changing conditions and actual costs. The Chemical Engineering Magazine Plant Cost Index can be used to adjust historical costs to today's cost values. Costs may also need to be adjusted to reflect higher costs in the San Francisco Bay Area, as cost models and estimates may differ when compared to lower cost regions throughout the country. Staff typically applies additional factors to capital and/or operating costs to reflect these uncertainties, market differences, and other adjustments.

Capital costs are normally amortized based on control equipment project life and prevailing interest rates, and assumptions and opinions on these parameters may vary. For this preliminary BARCT evaluation, amortized capital cost estimates are based on 11 percent amortization, 1 percent tax, 1 percent insurance, and 2 percent maintenance costs, totaling 15 percent amortization of capital. More detailed or specific amortization data and assumptions may also be used where appropriate. Operating costs are normally based on costs for energy, water, air, catalyst/reagent, and labor costs in the cost models or cost estimates. For preliminary BARCT evaluations where these operating cost data were not available, any control system that is likely to require significant energy, utilities, or catalyst usage is estimated to have total operating costs equal to 5 percent of capital cost. This approach provides a conservative initial estimate of operating costs for all the but most

¹⁶ United States Environmental Protection Agency (EPA), 2018c. Cost Analysis Models/Tools for Air Pollution Regulations, <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-analysis-modelstools-air-pollution>. Updated May 23, 2018.

energy intensive control methods.

Cost Effectiveness and Incremental Cost Effectiveness

California Health and Safety Code (H&SC), Section 40703 requires the Air District to consider the cost effectiveness of a control measure when adopting any regulation. Cost effectiveness is calculated by dividing the annual costs (including capital amortization and operating costs) by the total number of tons of emission reductions expected each year. The result is the cost effectiveness of implementing the control method retrofit at the existing source.

H&SC Section 40920.6 requires the Air District to identify one or more potential alternative control method that achieves the emission reduction objectives of the rule or regulation and estimate the incremental cost effectiveness between the proposal and the alternative. Incremental cost effectiveness is calculated when two (or more) control methods are being considered. First, cost effectiveness is calculated for the less stringent control method, as described above. Incremental cost effectiveness is then calculated by: 1) calculating the incremental increase in cost between the first control method and the second more stringent control method, and 2) dividing the incremental increase in cost by the incremental increase in emission reductions from the second more stringent control method. This analysis is used to help determine which controls should be recommend when multiple options are available.

Estimates of cost effectiveness for the rule development projects (where available) are shown in Table 4. More detailed information and further discussion on costs and cost effectiveness for the rule development projects can be found in the individual project scopes in Attachment A.

Table 4: Potential Emission Reductions and Cost Effectiveness

Rule Development Projects		Potential Emission Reductions (tpy) ¹⁷	Cost Effectiveness (\$/ton) ¹⁸
1	Rule 8-5: Organic Liquid Storage Tanks	ROG: 75 to 125 tpy	ROG: \$10,000 to \$20,000
2	Rule 8-8: Petroleum Wastewater Treating	ROG: Unknown	ROG: Unknown
3	Rule 9-13: Portland Cement Manufacturing	PM: Unknown SO ₂ : 698 tpy	PM: Unknown SO ₂ : \$2,100
4	Rule 6-5: Refinery Fluid Catalytic Crackers and CO Boilers	PM: Unknown SO ₂ : 567 tpy	PM: Unknown SO ₂ : \$4,000 to \$47,000
5	Rule 8-18: Refinery Heavy Liquids Leaks	ROG: Unknown	ROG: Unknown
6	Rule 9-14: Petroleum Coke Calcining Operations	NOx: Unknown	NOx: Unknown

¹⁷ More detailed information and further discussion on potential emission reductions for the rule development projects can be found in the individual project scopes in Attachment A.

¹⁸ More detailed information and further discussion on costs and cost effectiveness for the rule development projects can be found in the individual project scopes in Attachment A.

Note that for some of the potential rule development projects in Table 4, estimates of emission reductions and cost effectiveness may be unknown or uncertain at this time. For particular sources or pollutants, there may be uncertainties associated with emission estimates or the level of control and emission reductions achievable, and further study and evaluation would be required to develop more detailed estimates. For example, potential emission reductions of condensable PM are often difficult to quantify due to the complex nature of condensable PM formation. This formation can be highly dependent on site-specific source parameters, including flue gas properties and composition. Because control strategies typically involve the reduction of condensable components and precursors (such as ammonia and SO₂) instead of a direct limit on condensable PM, reductions of condensable PM emissions associated with these precursor controls may be difficult to estimate without further characterization and evaluation. More detailed information and further discussion on the potential emission reductions, costs, and cost effectiveness for the rule development projects can be found in the individual project scopes in Attachment A.

V. ENVIRONMENTAL IMPACTS

Review of Potential Environmental Impacts Under CEQA

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. The Air District contracts with an independent consultant to conduct a CEQA analysis of potential environmental impacts from any rule making projects. Since the Expedited BARCT Implementation Schedule would consist of the implementation of several rule development projects to fulfill the requirements of AB 617, a CEQA analysis was conducted for the entire suite of potential rule development projects.

The Air District prepared a Notice of Preparation and an Initial Study (NOP/IS) for the Draft Environmental Impact Report (DEIR) for the Expedited BARCT Implementation Schedule. The NOP/IS was distributed to interested parties and published on the Air District's website on August 7, 2018 for review and comment. A CEQA scoping meeting was conducted on August 24, 2018, where minimal public comments were received. Written comments on the NOP/IS were accepted through September 7, 2018. The Air District prepared a Draft Environmental Impact Report to address the potential environmental impacts associated with the Expedited BARCT Implementation Schedule. The Draft EIR was published on October 23, 2018 for review and comment, and written comments were accepted through December 7, 2018. One comment letter on the Draft EIR was received during the comment period, and responses to the comments are included in the Final EIR. Prior to making a decision on the adoption of the proposed Expedited BARCT Implementation Schedule, the Air District's Board of Directors must review and certify the Final EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed schedule. The EIR concluded that air quality impacts during the construction of additional pollution control equipment were found to remain potentially significant after mitigation and cumulatively considerable. Hydrology and water quality impacts associated with water demand from the operation of control equipment were found to remain potentially significant after mitigation and cumulatively considerable.

VI. SCHEDULE DEVELOPMENT/PUBLIC CONSULTATION PROCESS

Schedule Development Process

The process for development of the AB 617 Expedited BARCT Implementation Schedule has been adjusted slightly from the typical rule development process. Because AB 617 requires the Air District to develop a schedule for developing BARCT rules before developing the individual rules themselves, the development of the Expedited BARCT Implementation Schedule is more comparable in scope to an air quality plan, such as the Air District's 2017 Clean Air Plan. Similar to an air quality plan, the Expedited BARCT Implementation Schedule identifies and describes potential regulatory strategies, rules, and rule amendments, which would be further developed in the future. Therefore, development of the Expedited BARCT Implementation Schedule follows most of the Air District's typical steps for developing rules and plans.

Air District staff initially reviewed requirements of AB 617, including markups of the pertinent sections of the H&SC. Staff developed the emissions inventory information for affected facilities to perform the preliminary BARCT review and evaluation. This process involved screening sources to identify source categories with significant potential for emission reductions, researching BACT/RACT/LAER controls and emissions levels, identifying a preliminary BARCT level, and determining potential emission reductions. Staff also estimated retrofit capital costs and annual cost of controls, and calculated cost effectiveness of emission reductions. Staff then identified and prioritized the potential rule development projects based on health benefits, air quality impacts, cost effectiveness, and the length of time since these sources had last been addressed through rules or permit limits. Staff developed detailed project scope papers for each potential rule development project to further discuss the preliminary evaluation process, and to identify and review current source information, available controls and costs, potential emission limits, cost effectiveness, and any further considerations and issues. Finally, staff developed a concept paper describing the BARCT determination process and potential rule development projects included in the Expedited BARCT implementation schedule.

Air District staff published the concept paper and rule development project scope papers for the draft schedule on the Air District website on May 24, 2018 and accepted written comments on the documents through June 15, 2018. Staff also met with representatives from affected facilities and industries, such as refinery and cement manufacturing plant representatives. Staff discussed this AB 617 Expedited BARCT Implementation Schedule with community members and environmental groups and presented on the status of the project at a Board of Directors Stationary Source Committee meeting on May 21, 2018.

Staff received input from these sources and prepared an Initial Staff Report and revised rule development scope papers. Staff published these documents on the Air District website on September 5, 2018 and accepted comments on these documents through October 5, 2018. An update on the Expedited BARCT Implementation Schedule was presented at the Air District's Board of Directors meeting on September 5, 2018.

Air District staff considered input received on the Initial Staff Report and related materials, and continued to conduct further analysis, coordinate with CARB and other air districts, and meet with affected facilities and industries. Staff published the proposed Expedited BARCT Implementation Schedule and Staff Report for public review and comment on October 23, 2018 and accepted written comments through December 7, 2018. Three comment letters on the proposed BARCT Schedule and Staff Report were received, and staff prepared a summary of comments received and responses for inclusion in the final proposal package. Staff will present final proposals to the Air District's Board of Directors for their consideration. At the Public Hearing, the Air District Board of Directors will consider the final proposal and receive public input before taking any action on the Expedited BARCT Implementation Schedule.

Note that each individual rule development project will also follow the standard rule development process. As described in the schedule, rule development activity is anticipated to occur throughout the period from 2018 to 2021.

Public Outreach and Consultation

In developing the proposed Expedited BARCT Implementation Schedule and Final Staff Report materials, staff solicited public comments on the concept paper, Initial Staff Report, and Staff Report, and conducted early stakeholder engagement with affected facilities, as described above. Input received during these outreach efforts, along with further investigation and analysis by staff, were used to develop the final proposals for consideration by the Air District's Board of Directors. Throughout the outreach process for the development of the schedule, Air District staff also engaged in additional early outreach with stakeholders for individual rule development projects, and will continue those efforts as those projects progress.

VII. CONCLUSION/RECOMMENDATIONS

The AB 617 requirements for the Expedited BARCT Implementation Schedule are described in H&SC 40920.6(c). This section requires that each air district in nonattainment for one or more air pollutants adopt an expedited schedule for implementation of BARCT by the earliest feasible date, but no later than December 31, 2023. The Air District is in non-attainment for ozone and PM.^{19,20} The expedited schedule must be adopted no later than January 1, 2019. The section states that the schedule shall apply to each industrial source subject to California GHG Cap-and-Trade requirements and must give priority to any sources that have not had emissions limits modified for the greatest period of time. The schedule shall not apply to sources that have implemented BARCT since 2007. As described in Section II and Section III of this report, Air District staff has evaluated and identified sources subject to these requirements and conducted analyses to determine the appropriate applicability of the schedule. The proposed schedule identifies the potential

¹⁹ United States Environmental Protection Agency (EPA), 2018a. Eight-Hour Ozone (2015) Nonattainment Areas by State/County/Area. Data is current as of September 30, 2018.

<https://www3.epa.gov/airquality/greenbook/jncty.html>

²⁰ United States Environmental Protection Agency (EPA), 2018b. PM-2.5 (2006) Designated Area Area/State/County Report, Data is current as of September 30, 2018.

https://www3.epa.gov/airquality/greenbook/rbca.html#PM-2.5.2006.San_Francisco

rule development projects that would evaluate and implement BARCT controls at the affected sources and includes timelines for the rule development process to address these AB 617 requirements no later than December 31, 2023.

The AB 617 requirements for adoption of the Expedited BARCT Implementation Schedule are described in H&SC 40920.6(d). This section states that prior to adopting the schedule, the Air District shall hold a public meeting and take into account the local public health and clean air benefits to the surrounding community, the cost effectiveness of control options, and air quality and attainment benefits of control options. As described in Section II and Section III of this report, the staff's process for reviewing BARCT controls and developing the proposed BARCT schedule involved evaluating potential emission reductions, identifying the potential for toxic emission reduction co-benefits, and considering the cost-effectiveness of control options. These are further described for the potential rule development projects in their respective individual project scopes included in Attachment A. As such, these considerations were taken into account during the development of the proposed Expedited BARCT Implementation Schedule and support the adoption of the proposed schedule. The Air District will present the final proposal to the Air District Board of Directors at a Public Meeting for consideration. In addition, the Air District solicited comments from the public and affected facilities and industries throughout the development process, held a CEQA Scoping Meeting on August 24, 2018, and presented updates on the development of the Expedited BARCT Implementation Schedule at the Air District Stationary Source Committee and Board of Directors meetings, as described in Section VI of this report.

Staff recommends the Air District Board of Directors adopt the proposed Expedited BARCT Implementation Schedule and certify the associated CEQA Environmental Impact Report.

VIII. REFERENCES

Email correspondence between K. Magliano, CARB and A. Abbs, CAPCOA, “BARCT List.” June 18, 2018.

United States Environmental Protection Agency (EPA), 2018a. Eight-Hour Ozone (2015) Nonattainment Areas by State/County/Area. Data is current as of September 30, 2018. <https://www3.epa.gov/airquality/greenbook/jncty.html>

United States Environmental Protection Agency (EPA), 2018b. PM-2.5 (2006) Designated Area Area/State/County Report, Data is current as of September 30, 2018. https://www3.epa.gov/airquality/greenbook/rbca.html#PM-2.5.2006.San_Francisco

United States Environmental Protection Agency (EPA), 2018c. Cost Analysis Models/Tools for Air Pollution Regulations, <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-analysis-modelstools-air-pollution>. Updated May 23, 2018.

ATTACHMENT A

Scope Papers for Potential Rule Development Projects in Expedited BARCT Implementation Schedule

1. Organic Liquid Storage Tanks
2. Petroleum Wastewater Treating
3. Portland Cement Manufacturing
4. Refinery Fluid Catalytic Crackers and CO Boilers
5. Refinery Heavy Liquid Leaks
6. Petroleum Coke Calcining

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ATTACHMENT B

Proposed AB 617 Expedited BARCT Implementation Schedule

Rule Development Project	Pollutants Addressed	Anticipated Development Schedule	2018				2019				2020				2021				
Rule 8-5: Organic Liquid Storage Tanks	ROG	Q4 2018 – Q1 2020																	
Rule 8-8: Petroleum Wastewater Treating	ROG	Q1 2019 – Q3 2020																	
Rule 9-13: Portland Cement Manufacturing	PM, SO ₂	Q2 2019 – Q2 2021																	
Rule 6-5: Refinery Fluid Catalytic Crackers and CO Boilers	PM, SO ₂	Q1 2019 – Q4 2020																	
Rule 8-18: Refinery Heavy Liquids Leaks	ROG	Q1 2019 – Q4 2019																	
Rule 9-14: Petroleum Coke Calcining Operations	NO _x	Q3 2020 – Q3 2021																	

ATTACHMENT C

Additional Source Categories for Further Study and Consideration with Local Community Emission Reduction Plans

<u>Other Source Categories Being Considered</u>	PM	NOx	ROG	SO ₂
Cooling Towers	X			
Fuel Gas Combustion Practices				
• Boilers				
• Gas Turbines	X		X	
• Hydrogen Furnaces				
• Process Heaters				
Internal Combustion (Reciprocating) Engines			X	
Incinerators		X		
Marine Terminal Loading			X	
Natural Gas Furnaces		X	X	
Natural Gas Dryers		X	X	
Refinery Flares		X	X	
Solvent Cleaning			X	
Sulfur Plants	X	X		
Thermal Oxidizers		X		
Wallboard Manufacturing	X			

As shown in the table above, Air District staff identified 12 additional source categories for further study and consideration. Based on the preliminary review process, staff believes that there is limited potential to apply additional BARCT controls and achieve substantial reductions at these sources. Staff identified a number of factors that may limit the potential emissions reductions and efficacy of further controls at these sources:

- **Potential emissions reductions are relatively small** – For many of the source categories identified, staff’s research indicates that more stringent controls or limits may have been achieved at other facilities, but potential emission reductions from current levels may be relatively small or incremental in nature due to the existing controls or limits at affected facilities. In such cases, implementation of additional controls may not achieve substantial emission reductions and may be constrained by issues regarding technological feasibility and cost effectiveness.
- **Estimates of emissions and emissions reductions may be uncertain and require further study** – Certain emissions and emission sources have historically been difficult to characterize and quantify, resulting in uncertainties regarding

current impacts and potential reductions. For example, PM emissions from cooling towers have been difficult to accurately measure and estimate due to the large physical size of the source, configuration of cooling tower emissions points that prevent proper source testing, and the nature of the organic and inorganic salt content of these PM emissions. Current emissions estimates may not adequately reflect the actual emissions and efficacy of existing controls, therefore additional research and study would be needed to evaluate potential emission reductions and control options.

- **Control options may not be technologically feasible or may not be suitable for retrofit** – Some control options may not be feasible for retrofit at certain sources. For some sources with existing control equipment, it may be possible to upgrade, modify, or add capacity to the existing control system, however there may be cases where an additional level of control would require complete rebuilding or replacing control equipment. In such cases, these additional considerations may result in certain control options being deemed infeasible or not cost effective.
- **Many control options identified may not meet cost effectiveness criteria to be considered BARCT** – Cost effectiveness is calculated by dividing the annual control costs by the annual tons of anticipated emission reductions. Because the potential emission reductions identified for these sources are small and incremental in nature, many control options that involve substantial capital and operating costs would not meet the cost effectiveness criteria to be considered BARCT.

Additionally, further controls on these sources may have limited potential to effectively impact localized exposures in communities or attainment of ambient air quality standards. Based on the limited potential for substantial controls and emissions reductions, staff does not recommend that these potential rule projects be included as priority rule development projects in the Expedited BARCT Implementation Schedule at this time. Staff believes that these projects merit further study, and actions on these source categories may be more appropriately considered during development of local Community Emission Reduction Plans. Staff anticipates that further evaluation and study, during the AB 617 community-based monitoring, modeling, and planning activities, will inform future potential regulatory actions for these source categories.

Organic Liquid Storage Tanks – Rule Development Project Scope

Summary

This rule development project would address emissions of reactive organic gases (ROG) from organic liquid storage tanks. Staff estimates that preliminary best available retrofit control technology (BARCT) levels may result in ROG emission reductions, as well as reductions of associated toxic air contaminant (TAC) emissions from organic liquid tank storage. Staff recommends considering amending Regulation 8, Rule 5: Storage of Organic Liquids to specifically address these ROG and TAC emissions from external floating roof tanks storing organic liquids. Rulemaking for emissions of oxides of nitrogen (NO_x), sulfur dioxide (SO₂), and particulate matter (PM) is not anticipated at this time.

Background

The Air District has regulated emissions from tanks storing organic liquids for nearly 50 years, first under former Regulation 3, which was adopted in 1967, and later under Regulation 8, Rule 5: Storage of Organic Liquids. Rule 8-5 was originally adopted in 1978 and has been amended several times. By 1993, this rule included most of the control strategies found in the current rule, including gap standards for floating roof rim seals, pressure vacuum valve setpoint requirements for fixed roof tanks, closure requirements for tank roof fittings, and tank degassing requirements. Amendments in 2006 improved the rule, primarily in the area of non-routine operations, such as tank degassing and cleaning.

Storage vessels containing organic liquids can be found in many industries, including petroleum producing and refining, petrochemical and chemical manufacturing, bulk storage and transfer operations, and other industries consuming or producing organic liquids. Organic liquids in the petroleum industry, usually called petroleum liquids, generally are mixtures of hydrocarbons having dissimilar true vapor pressures (for example, gasoline and crude oil). Organic liquids in the chemical industry, usually called volatile organic liquids, are composed of pure chemicals or mixtures of chemicals with similar true vapor pressures (for example, benzene or a mixture of isopropyl and butyl alcohols).

Six basic tank designs are used for organic liquid storage vessels: fixed roof (vertical and horizontal), external floating roof, domed external (or covered) floating roof, internal floating roof, variable vapor space, and pressure tanks (low and high).

ROG

Regulatory Context and Preliminary BARCT Level

Emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. The emission sources vary with tank design, as does the relative contribution of each type of emission source. Emissions from fixed

roof tanks are a result of evaporative losses during storage (known as breathing losses or standing storage losses) and evaporative losses during filling and emptying operations (known as working losses). External and internal floating roof tanks are emission sources because of evaporative losses that occur during standing storage and withdrawal of liquid from the tank. Standing storage losses are a result of evaporative losses through rim seals, deck fittings, and/or deck seams.

Existing Applicable Regulations

Tanks used for bulk storage of organic liquids or liquid mixtures containing organic compounds are regulated under Air District Rule 8-5. Such tanks are typically found at petroleum refineries and chemical plants, as well as gasoline bulk plants and terminals. Underground gasoline storage tanks located at gasoline stations are regulated under Air District Regulation 8, Rule 7: Gasoline Dispensing Facilities, and are not addressed in Rule 8-5.

Federal tank regulations include new source performance standards (NSPS) in 40 CFR 60 Subpart Kb, and Maximum Achievable Control Technology (MACT) standards in 40 CFR 63 Subpart CC. Each of these federal requirements require certain storage vessel provisions in terms of control, monitoring, and recordkeeping.

South Coast Air Quality Management District (SCAQMD) maintains their tank regulations in Regulation 1178. The rule applies to all aboveground storage tanks with capacities greater than or equal to 75,000 liters (19,815 gallons) that are used to store organic liquids with a true vapor pressure greater than five millimeters of mercury (mm Hg) (0.1 psi) absolute under actual storage conditions, and are located at any petroleum facility that emits more than 40,000 pounds (20 tons) per year of volatile organic compounds (VOC) in any emission inventory year, starting with the emission inventory year 2000. The rule also includes requirements for domed roofs. Several exemptions are also listed in the rule, the most notable of which include: 1) exemption from doming requirements for crude oil tanks, 2) exemption of facilities with an emission cap equal to or less than 20 tons per year, and 3) exemption from doming requirements for tanks with true vapor pressure limits less than 3 psia.

Review of BACT and Potential Controls

Best Available Control Technology (BACT) for external floating roof storage tanks containing organic liquids is found in the Air District BACT Guideline 167.1.2 dated September 2011. This BACT guideline includes information on two categories of BACT: 1) "technologically feasible and cost effective" and 2) "achieved in practice". The first category of BACT is a more stringent level of control, and generally refers to advanced control devices or techniques. The guideline indicates that a vapor recovery system (VRU) with an overall system efficiency of at least 98 percent would constitute BACT that is "technologically feasible and cost effective". Typical technology implemented for this BACT level includes a thermal incinerator, carbon adsorber, refrigerated condenser, or an Air District-approved equivalent.

The guideline indicates that the BACT level "achieved in practice" is an Air District-approved roof with liquid mounted primary seal and zero gap secondary seal, all meeting the design

criteria of Rule 8-5. The tank system must have no ungasketed roof penetrations, no slotted pipe guide pole (unless equipped with a float and wiper seals), and no adjustable roof legs (unless fitted with vapor seal boots or equivalent). Additionally, a dome is required for tanks that meet the following criteria: 1) capacity greater than or equal to 19,815 gallons, 2) located at a facility with greater than 20 tons per year of VOC emissions since the year 2000, and 3) storing material with a vapor pressure equal to or greater than 3 pounds per square inch absolute (psia) (except for crude oil tanks that are permitted to contain more than 97 percent crude oil by volume).

Potential Emission Reductions and Impacts

Emissions generated from organic liquid storage tanks for AB 617 identified sources in the Air District are nearly 840 tons per year from approximately 100 tanks. Table 1 below shows AB 617 identified floating roof (non-crude), coned roof (non-crude), and crude tank storage.

Table 1. AB 617 Organic Liquid Storage Tank Emission Summary

Tank Type	Number of Identified Tanks	Annual ¹ Emissions (TPY)
Floating Roof ¹	30	400
Coned Roof	47	300
Other	9	40
Crude	14	100
Total	100	840

¹ Floating roof tanks include both external floating roof and internal floating roof. Further distinction between these two types has not yet been identified.

² 2016 emissions referenced in Air District data files. Emission factors vary from AP-42, 7.1 to Tanks 4.09D emission calculations.

Crude units identified above include both coned and floating roof tank types. Tanks associated with refineries comprise over 95 percent of the AB 617 organic liquid storage tanks identified above. Additional tanks were identified in the AB 617 analysis but excluded from further BARCT analysis, as ROG emissions for each of these tanks were less than 10 pounds per day (1.8 TPY).

Potential ROG emission reductions may be achieved by installing domes on external floating roof tanks, and by capturing vented emissions from internal floating roof or coned roof tanks and removing ROG emissions through a vapor recovery unit (VRU) flowing back to the tank(s) or to a thermal incinerator. Domed roofs on external floating roofs without capture will reduce ROG by limiting wind effects. Tables 2, 3, and 4 below describe the potential emission reductions and cost effectiveness from these different control options at floating roof tanks. Note that each of the estimates for total capital cost and total annual costs below are based on approximately 10 tanks with Rule 8-5 applicability as external floating roof tanks (EFRTs).

Table 2. AB 617 Organic Liquid Storage Tanks BARCT Summary – Dome

Current Emissions, Floating Roof Tanks (tpy)	400
Potential Emission Reductions (tpy)	75
Preliminary BARCT Level	EFRT Dome with 75% Evaporation/Wind Effect Reduction
Controls Required	EFRT Dome
Total Capital Cost	\$6,250,000
Total Annual Cost	\$750,000
Cost-Effectiveness (\$/ton)	\$10,000

Table 3. AB 617 Organic Liquid Storage Tank BARCT Summary – Dome + VRU

Current Emissions, Floating Roof Tanks (tpy)	400
Potential Emission Reductions (tpy)	100
Preliminary BARCT Level	EFRT Dome + 98% Efficiency Vapor Recovery Unit
Controls Required	EFRT Dome + 98% Efficiency Vapor Recovery Unit
Total Capital Cost	\$8,500,000
Total Annual Cost	\$1,500,000
Cost-Effectiveness (\$/ton)	\$15,000

Table 4. AB 617 Organic Liquid Storage Tank BARCT Summary – Dome + VRU + Incinerator

Current Emissions, Floating Roof Tanks (tpy)	400
Potential Emission Reductions (tpy)	125
Preliminary BARCT Level	EFRT Dome + 98% Efficiency Vapor Recovery Unit + Incinerator
Controls Required	EFRT Dome + 98% Efficiency Vapor Recovery Unit + Incinerator
Total Capital Cost	\$12,000,000
Total Annual Cost	\$2,500,000
Cost-Effectiveness (\$/ton)	\$20,000

Dome installation on an external floating roof tank cost estimates assume a dome cost of approximately \$40 per square foot, with a construction cost of \$50,000. Using an average tank size of 135-foot diameter (based on Valero refinery gasoline tanks), dome capital costs (including installation) would be approximately \$625,000 per tank. Total annualized cost would be approximately \$75,000 per tank. Additional considerations would need to be made for tank age, earthquake structural supports, and fire suppression on certain tanks.

Vapor recovery units (VRU) capital costs are estimated to be approximately \$225,000 per single tank. There would likely be cost savings for VRU systems that are applied to multiple tanks with an associated increase in compressor size. Incinerators are estimated to require an additional

\$350,000 in capital costs per tank, with potential cost savings for systems combining several tanks into one VRU header prior to incineration. Additional fuel costs for incineration may also need to be considered and evaluated further.

In lieu of converting fixed roof tanks to internal floating roof tanks, operators may instead choose to vent the vapor losses from these fixed roof tanks to a vapor control system or a vapor recovery system for ROG control. Facilities with an existing vapor control or vapor recovery system on site may be able to accommodate the additional vapor recovery load without installation of additional systems or capacity. In this scenario, the costs of implementing this control option would be anticipated to be minor. However, the cost and cost effectiveness could vary significantly with each individual scenario depending on the location of the tanks, the size of the existing compressors, and the types of vapor control or vapor recovery system the facility would choose to use.

Further Considerations

Staff recommends working with stakeholders to collect additional tank design data and emission information associated with the organic liquid storage tanks at AB 617 identified facilities. Staff recommends forming an OLST (Organic Liquid Storage Tank) Working Group that may include representatives of affected facilities, environmental organizations, and manufacturers of domed roofs to discuss relevant control technologies for storage tanks. In parallel, staff may also perform site visits of the affected facilities to assess actual operating conditions. Additional refinements to estimates of current emissions and potential reductions would be needed to appropriately evaluate BARCT control options. This further study and refinement may involve additional estimation of ROG emissions through site visits, testing, monitoring, or assessment of emission estimation protocols and programs, such as the United States Environmental Protection Agency (EPA) TANKS version 4.09D program. Staff would also seek input through OLST Working Group meetings, public workshops, and numerous individual site visits and meetings with stakeholders.

SO₂

Organic liquid storage tanks do not typically generate substantial SO₂ emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time. There could be a slight increase in SO₂ emissions due to possible ROG vapor recovery system combustion; however, no additional rulemaking for SO₂ will be considered at this time.

NO_x

Organic liquid storage tanks do not typically generate substantial NO_x emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time. There could be a slight increase in NO_x emissions due to possible ROG vapor recovery system combustion; however, no additional rulemaking for NO_x will be considered at this time.

Particulate Matter

Organic liquid storage tanks do not typically generate substantial PM emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time. There could be a slight increase in PM emissions due to possible ROG vapor recovery system combustion; however, no additional rulemaking for PM will be considered at this time.

Petroleum Wastewater Treating – Rule Development Project Scope

Summary

This rule development project would address emissions of reactive organic gases (ROG) from petroleum wastewater treating operations. Staff estimates that preliminary best available retrofit control technology (BARCT) levels could result in potential ROG emission reductions. The Air District has addressed ROG emissions from petroleum wastewater treatment facilities in previous rule developments (Rule 8-8 Wastewater Collection and Separation Systems), but staff recommends reviewing each of the five Bay Area refineries for additional opportunities for reduction of wastewater ROG. This review may include on-site air emissions testing, which will require refinery cooperation. Any recommended and implemented ROG controls in addition to current regulatory requirements are also anticipated to reduce toxic air contaminant (TAC) emissions. Rulemaking for emissions of oxides of nitrogen (NO_x), sulfur dioxide (SO₂), and particulate matter (PM) is not anticipated at this time.

Background

All refineries employ some form of wastewater treatment so that water effluents can be safely returned to the environment or reused in the refinery. The designs of specific wastewater treatment plants are complex, and are complicated by the diversity of refinery pollutants, including oils, phenols, sulfides, dissolved solids, and toxic chemicals. Although the treatment processes employed by refineries vary greatly, they generally include drain systems, neutralizers, oil/water separators, settling chambers, clarifiers, dissolved air flotation systems, coagulators, aerated lagoons, and activated sludge ponds.

Drain systems consist of individual process drains, where oily water from various sources is collected, and junction boxes, which receive the oily water from multiple drains. Oil-water separators (OWS) generally represent the first step in the treatment of refinery wastewater. The separation and removal of the oil from the water are accomplished through density differences that cause oil to rise to the top and enable it to be skimmed off. Air flotation usually follows the oil-water separator and is used to remove remaining oil and solids by introducing air bubbles into the wastewater by mechanical means. The factors influencing emissions from these systems are wastewater composition, equipment design, and climatic factors.

ROG

Regulatory Context and Preliminary BARCT Level

The purpose of an amended rule would be to reduce ROG emissions from petroleum wastewater treatment operations located in the Air District. The main components of atmospheric emissions from wastewater treatment plants are fugitive ROGs and dissolved gases that evaporate from the surfaces of wastewater residing in open process drains, separators, and ponds. Treatment processes that involve extensive contact of wastewater and

air, such as aeration ponds and dissolved air flotation, have an even greater potential for atmospheric emissions.

The control of wastewater treatment plant emissions involves covering systems where emission generation is greatest (such as oil-water separators and settling basins) and removing dissolved gases from water streams with sour water strippers before contact with the atmosphere. These control techniques potentially can achieve greater than 90 percent reduction of waste water system emissions.

Emission Estimates

Current ROG emission estimates associated with refinery wastewater operations may vary widely and may not be consistently characterized between different systems and components. Some facilities report total wastewater ROG emissions for the overall treatment system, while others may delineate between OWS emissions and fugitive emissions. Additionally, other facilities may report no discernable ROG emission contributions from wastewater treatment components and systems. Considering these caveats and limitations, a reasonable estimate of annual ROG emissions attributable to refinery wastewater treatment systems is 300 to 600 tons per year. Additional review and study of current emissions inventories, refinery emission reporting methodology, emission factors, and calculations would be needed to appropriately inform future rule development.

Review of BACT and Potential Controls

Recent best available control technology (BACT) determinations from the United States Environmental Protection Agency (EPA) RBLC¹ database indicate that controls for refinery wastewater systems include requirements for process wastewater effluent treatment to utilize a covered system. All lift stations, manholes, junction boxes, conveyances, and any other wastewater facilities should be covered, and all emissions routed to a vapor combustor with a guaranteed destruction/removal efficiency (DRE) of 99 percent for control. Additionally, BACT includes a general requirement of good control practices.

The Air District lists a BACT determination of an OWS system with capacity greater than 250 gallons per minute. The determination includes a recommendation of a vapor tight fixed cover vented to a vapor recovery system with combined collection and destruction/removal efficiency greater than 95 percent.

Existing Applicable Regulations

Current Air District Rule 8-8: Wastewater Collection and Separation Systems requires oil-water separators to be covered. Additionally, Air District Rule 8-18: Equipment Leaks also requires refining operations to test for potential equipment leaks related to wastewater operations.

Applicable federal requirements include 40 CFR Part 60, Subpart QQQ; and 40 CFR Part 61, Subpart FF. Subpart QQQ focuses on the control of air emissions from process drains, junction

¹ RACT/BACT/LAER/Clearinghouse
Petroleum Wastewater Treating
BARCT Scope

boxes, and oil-water separators. Subpart FF pertains to benzene waste operations NESHAPs² (BWON). 40 CFR 63 Subpart CC (MACT³ 1) targets miscellaneous wastewater process vents.

Further Considerations

Refineries generate a large amount of wastewater that has both process and non-process origins. Depending on the type of crude oil, composition of condensate, and treatment processes, the characteristics of refinery wastewater can vary widely according to refinery-specific factors. Therefore, there is no singular approach to handling and treating refinery wastewater.

Accordingly, strategies to further reduce ROG emissions will require development and refinement of emissions testing protocols, as well as individual refinery cooperation with the Air District measurements and testing staff. Further evaluation of the potential control options identified, as well as their efficacy, feasibility, and cost-effectiveness, would depend heavily on these additional study and research efforts. In addition to the wastewater treatment system components discussed, aeration ponds can also be a large area source of ROG emissions in the petroleum wastewater treatment process. Control strategies for this type of source are unknown at this time, but would also need to be studied further.

Additional coordination between individual facilities and the Air District Measurements and Meteorology Division and Engineering Division staffs will be required to determine individual refinery specific measurement data, coordinate emission factor development across refineries, and review emission estimation techniques and methodologies. Previous Air District efforts, including studies of refinery wastewater conducted in 2006, would be reviewed and referenced in developing these further analyses and efforts. Staff recommends additional evaluation and research prior to development of a draft BARCT limit or rule.

SO₂

Petroleum refinery wastewater treatment processes do not typically generate substantial SO₂ emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

NO_x

Petroleum refinery wastewater treatment processes do not typically generate substantial NO_x emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

Particulate Matter

Petroleum refinery wastewater treatment processes do not typically generate substantial PM emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

² National Emissions Standards for Hazardous Air Pollutants

³ Maximum Achievable Control Technology

Portland Cement Manufacturing – Rule Development Project Scope

Summary

This rule development project would address emissions from Portland cement manufacturing operations. Staff estimates that preliminary best available retrofit control technology (BARCT) levels may result in potential emission reductions of particulate matter (PM) and sulfur dioxide (SO₂). Rulemaking for emissions of oxides of nitrogen (NO_x) and reactive organic gases (ROG) is not anticipated at this time.

Background

Portland cement is used as a component of concrete, which can be used in a variety of construction projects. The Portland cement manufacturing process involves the mining of limestone, crushing and blending of the limestone with other raw materials (such as clay, sand, and alumina), calcining of the mixture in a cement kiln to produce clinker, and the subsequent cooling, grinding, and mixing of the clinker with gypsum and additional limestone to produce cement. Cement kiln operations can generate substantial PM, NO_x, and SO₂ emissions from the combustion of fuel and the heating and calcining of feed materials. PM emissions also arise from other aspects of material handling, including crushing, mixing, storage, and clinker cooling. One Portland cement manufacturing facility operates within the San Francisco Bay Area.

Particulate Matter

Regulatory Context and Preliminary BARCT Level

Federal rules that address emissions from Portland cement manufacturing include New Source Performance Standards (NSPS) Subpart F and National Emissions Standards for Hazardous Air Pollutants (NESHAP) Subpart LLL. The NSPS and NESHAP subparts include multiple PM emission limits for new and existing cement kilns. The Air District adopted Regulation 9, Rule 13 (Rule 9-13): Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing in 2012 (with subsequent amendments in 2016), which contains the following PM emission limits: 0.04 pounds of filterable PM per ton clinker (lb/ton clinker) from cement kilns and 0.04 lb/ton clinker from clinker coolers. Staff's review of existing best available control technology (BACT) guidelines and recent determinations indicates that PM emission levels of 0.01 grains of filterable PM per dry standard cubic foot (gr/dscf) and 0.02 lb/ton clinker have been achieved at cement kilns.

The existing regulatory limits, guidelines, and determinations described above are based on methods for monitoring and measuring filterable particulate matter only. Recent advancements in the understanding and quantification of condensable particulate matter formation indicate that cement kilns may emit substantial amounts of condensable PM in addition to filterable PM. Therefore, staff believes that the PM limits in BAAQMD Rule 9-13 adopted in 2012 may not

reflect current BARCT levels for addressing total (filterable and condensable) PM. Staff believes that substantial reductions of condensable PM emissions are achievable, however research of potential control options for cement kilns is ongoing, and a preliminary BARCT level is still under development. Controls may involve reduction of SO₂, ammonia (NH₃), or other condensable components and precursors. Note that further discussions on SO₂ controls and BARCT levels are included in the SO₂ section of this scope. Staff believes that SO₂ emission reductions would also be an integral part of reducing these condensable PM emissions, and anticipates that these SO₂ and PM control efforts would be considered and developed in concert.

Potential Emission Reductions and Impacts

Because a preliminary BARCT emission level for condensable PM has not yet been identified, estimates of potential emission reductions and control costs are not currently available. Staff estimates that cement manufacturing emits approximately 600 tons per year of total PM (including filterable and condensable PM), and the potential for substantial emission reductions should be further evaluated.

Further Considerations

Additional testing and study of the cement kiln are likely necessary to properly characterize condensable PM emissions. Potential control options, as well as their efficacy, feasibility, and cost-effectiveness, would depend heavily on this evaluation. Efforts towards development and/or implementation of cement kiln SO₂ BARCT controls should also be considered in any future study and evaluation of cement kiln condensable PM emissions.

SO₂

Regulatory Context and Preliminary BARCT Level

Federal NSPS Subpart F includes an emissions limit of 0.4 lb SO₂ per ton clinker on a 30-day rolling average basis; however, this limit only applies to cement kilns constructed, reconstructed, or modified after June 16, 2008. Air District Rule 9-13 addresses Portland cement manufacturing emissions, but does not include limits on SO₂ emissions.

Staff's review of existing BACT guidelines and recent determinations indicate that performance levels of 0.16 to 1.0 lb SO₂ per ton clinker have been achieved at cement kilns. Typical controls include judicious selection and use of raw materials, use of low sulfur fuels, dry scrubbing, and dry sorbent injection. Based on this review, staff has identified a preliminary BARCT level of 1.0 lb SO₂ per ton clinker. This preliminary BARCT level is used for staff's evaluation of potential BARCT controls, compliance costs, and emissions reductions, but may change as controls are further evaluated.

Potential Emission Reductions and Impacts

Based on staff's identified preliminary BARCT level and understanding of current performance of the potentially affected sources, staff estimates a potential emission reduction of 698 tons per year of SO₂. The facility currently operates lime injection and sodium carbonate systems for control of HCl emissions, but staff anticipates that additional lime injection capacity or an additional dry sorbent injection system would be required to meet the preliminary BARCT level

for SO₂. The capital cost of the current lime injection system was \$700,000, with operating costs of \$1.26 million per year.¹ Based on EPA cost estimating methods and assumptions for lime injection systems at cement kilns,² the capital cost of an appropriately sized system for the facility is estimated to be less than \$500,000, with annual operating costs of approximately \$1 million dollars. Based on the costs of the facility's current lime injection system and EPA cost estimates of dry lime injection systems for SO₂ control, staff conservatively estimates capital costs of the additional control system to be approximately \$1.4 million dollars. Total annualized cost of the additional control (including amortized capital and operating costs) is estimated to be \$1.47 million dollars per year, resulting in a cost-effectiveness of approximately \$2,100 per ton of SO₂.

Table 1. Portland Cement Manufacturing SO₂ BARCT Summary

Current Emissions (tpy)	1,298
Potential Emission Reductions (tpy)	698
Preliminary BARCT Level	1.0 lb SO ₂ per ton clinker
Controls Required	Hydrated lime injection
Total Capital Cost	\$1,400,000
Total Annual Cost	\$1,470,000
Cost-Effectiveness (\$/ton)	\$2,100

Further Considerations

Sulfur dioxide emissions from the cement kiln are highly dependent on the sulfur content of the fuel and raw material being processed. Therefore, the efficacy of a lime injection system for SO₂ control and achievable limit may or may not be comparable from one cement manufacturing plant to another. Further site-specific analysis of the affected facility would be needed to appropriately evaluate the impact of existing controls on SO₂ emissions and better characterize the efficacy of additional controls. This may involve testing and optimization of additional lime injection, use of different sorbents, and modification of control equipment parameters, as well as further source testing (including speciation of condensable PM). Further refinements to the evaluation of control costs and cost-effectiveness are also needed. Draft and final proposed BARCT limits may change throughout the rule development process as additional testing, research, and evaluation is conducted.

NOx

Regulatory Context and Preliminary BARCT Level

Federal NSPS Subpart F includes an emission limit of 1.5 lb NOx per ton clinker on a 30-day rolling average basis; however, this limit only applies to cement kilns constructed, reconstructed, or modified after June 16, 2008. Air District Rule 9-13 addresses Portland cement

¹ BAAQMD, 2012. Staff Report – Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing. July.

² EPA, 2010. Summary of Environmental and Cost Impacts of Final Amendments to Portland Cement NESHAP. August.

manufacturing emissions, and contains an emission limit of 2.3 lb NO_x per ton clinker on a 30-operating day rolling average.

Staff believes that the NO_x limits in Rule 9-13 adopted in 2012 reflect BARCT for NO_x, and further BARCT evaluation and rulemaking is not anticipated at this time.

ROG

Regulatory Context and Preliminary BARCT Level

The federal rules that address emissions from Portland cement manufacturing (NSPS Subpart F and NESHAP Subpart LLL), do not contain limits on ROG, although NESHAP Subpart LLL does include limits to control total hydrocarbon emissions. Air District Rule 9-13 does not contain a ROG emissions limit for Portland cement manufacturing, but contains an emission limit of 24 ppmv (dry at 7 percent O₂) for total hydrocarbon.

The cement kiln does not generate substantial ROG emissions (approximately 1.3 tons per year), and staff believes that BARCT controls to further reduce these emissions are not likely to be cost-effective. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

Fluidized Catalytic Crackers and CO Boilers – Rule Development Project Scope

Summary

This rule development project would address emissions from fluidized catalytic cracking units (FCCU) and carbon monoxide (CO) boilers at petroleum refineries. Staff estimates that preliminary best available retrofit control technology (BARCT) levels may result in potential emission reductions of particulate matter (PM) and sulfur dioxide (SO₂). Rulemaking for emissions of oxides of nitrogen (NO_x) and reactive organic gases (ROG) is not anticipated at this time.

Background

FCCUs are complex processing units at refineries that convert heavy components of crude oil into light, high-octane products that are required in the production of gasoline. FCCUs use a powdered catalyst to promote the hydrocarbon cracking process, and this catalyst becomes coated with carbonaceous material (coke) during its exposure to the hydrocarbon feedstock. Each FCCU includes a reaction vessel where the catalyst and feedstock are mixed, as well as a catalyst regenerator where coke is burned off the surface of the catalyst to restore its activity so that it can be re-used. Catalyst regenerators may be designed to burn the coke completely to carbon dioxide (CO₂) (full burn) or to only partially burn the coke to a mixture of CO and CO₂ (partial burn). Because the flue gas from these partial burn regenerators have high levels of CO, the flue gas is vented to a CO boiler where the CO is further combusted to CO₂. FCCUs and associated CO boilers can generate substantial PM, NO_x, and SO₂ emissions.

Four of the five refineries in the San Francisco Bay Area operate FCCUs: Chevron Richmond, Shell Martinez, Andeavor Martinez, and Valero Benicia. Shell Martinez operates a partial burn regenerator and three CO boilers. Valero Benicia also operates a partial burn regenerator and two CO boilers, which are abated by a wet gas scrubber. Andeavor Martinez operates one CO boiler that processes flue gas from its FCCU regenerator. Andeavor's regenerator operates in full burn mode, but does operate in partial burn mode for limited periods under unusual circumstances. Chevron Richmond operates a full burn FCCU and does not have CO boilers.

Particulate Matter

Regulatory Context and Preliminary BARCT Level

Federal rules that address emissions from FCCUs and CO boilers include New Source Performance Standards (NSPS) Subparts J and Ja, and National Emissions Standards for Hazardous Air Pollutants (NESHAP) Subpart UUU. NSPS Subpart J contains a PM emission limit of 1.0 kilograms of filterable PM per megagram (kg/Mg) (2.0 lb/ton) of coke burnoff in the catalyst regenerator and an opacity limit of 30 percent. NSPS Subpart Ja has a PM emission limit of 1.0 g/kg of coke burnoff for FCCUs reconstructed or modified after May 14, 2007, and a

limit of 0.5 g/kg of coke burnoff for FCCUs newly constructed after May 14, 2007. NESHAP Subpart UUU includes various PM emission limit options for compliance. Air District Regulation 6, Rule 1: Particulate Matter – General Requirements contains an opacity limit of 20% for all sources, including FCCUs and CO boilers.

These existing federal and Air District limits are based on methods for monitoring and measuring filterable particulate matter only. Recent advancements in the understanding and quantification of condensable particulate matter formation indicate that FCCUs and CO boilers may emit substantial amounts of condensable PM in addition to filterable PM. The Air District adopted Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (Rule 6-5) in 2015 to reduce condensable PM emissions through reduction of ammonia injection. Ammonia is injected in FCCU flue gas to suppress NO_x formation and improve the efficacy of electrostatic precipitators (ESP) for filterable PM abatement, but unreacted ammonia may be present in the exhaust stream (ammonia slip) and contribute to condensable PM formation. Rule 6-5 requires FCCUs to meet ammonia slip limits or conduct optimization of ammonia injection.

Implementation of BAAQMD Rule 6-5 is ongoing, with optimization testing having occurred through 2016 and 2017. Testing indicates that reduction of ammonia injection has the potential to substantially reduce condensable PM emissions. However, because ammonia injection is used as a component of abatement systems for filterable PM, injection rate reductions may be limited by compliance issues with filterable PM and opacity operating limits. Staff believes that substantial reductions of the condensable PM emissions are achievable, however evaluation of control options is ongoing, and a preliminary BARCT level is still under development. Control options may involve further optimization and reduction of condensable components and precursors (such as ammonia and SO₂) or operation of a wet gas scrubber.

Staff is evaluating additional amendments to Rule 6-5 to further reduce ammonia slip following the conclusion of the current ammonia injection optimization process. Enhancements may include modifications to the ammonia optimization requirements and/or ammonia slip limit. Enhanced ammonia slip requirements and limits may require the upgrade or installation of additional ESP capacity to improve filterable PM removal and reduce the need to ammonia injection, or use of alternative flue gas conditioning agents. Results from the current ammonia optimization testing may provide information on the level of controls needed and the achievable ammonia slip levels. Staff may also consider additional amendments or adjustments to the existing filterable PM and opacity limits to better harmonize with new condensable PM rule development efforts and focus on potentially large reductions in total PM.

Potential Emission Reductions and Impacts

Staff estimates that FCCUs and CO boilers emit approximately 480 tons per year of total PM, and the potential for substantial emission reductions should be further evaluated. Estimates of potential emission reductions would also be highly dependent on the efficacy of the current Rule 6-5 implementation process and ammonia optimization. Therefore, emission reductions and cost-effectiveness of these controls may be more appropriately evaluated following the

conclusion of the current Rule 6-5 implementation. Additional baseline testing of current condensable PM emissions should also be conducted as part of this ongoing evaluation.

Costs of additional controls for reducing ammonia slip may vary depending on the types of control options required. Staff reviewed ESP cost data and information from previous analyses from South Coast Air Quality Management District (SCAQMD)¹ and EPA,² and estimated that capital costs of additional ESP capacity or upgrades may range from \$20 million to \$50 million per facility. Implementation of alternative conditioning agents would be anticipated to require lower capital and operating costs compared to ESPs. Further site-specific considerations of current ESP and ammonia injection performance, additional control costs, and space constraints would be needed to appropriately evaluate the potential for achieving substantial condensable PM reductions. As discussed previously, evaluation of potential emission reductions and cost-effectiveness of these additional controls would be more appropriate following the conclusion of the current Rule 6-5 implementation.

Further Considerations

Additional testing and study of the FCCUs and CO boilers are likely necessary to properly characterize condensable PM emissions. This further study would be expected to inform the evaluation of efficacy, feasibility, and cost-effectiveness of various potential control options. Potential controls involving ESP improvements or additional capacity would need to be evaluated for costs and space constraints, and the feasibility of achieving the ammonia slip limit would need to be analyzed on a site-specific basis. Potential controls involving wet gas scrubbing would also need to be evaluated for other potential environmental impacts, as wet gas scrubbers may require substantial water usage.

SO₂

Regulatory Context and Preliminary BARCT Level

Federal NSPS Subpart J contains SO₂ emission limits of 9.8 kg/Mg (20 lb/ton) of coke burnoff, and 50 parts per million by volume (ppmv) SO₂ for an FCCU with an add-on control device. NSPS Subpart Ja contains SO₂ emission limits of 50 ppmv SO₂ on a seven-day rolling average basis and 25 ppmv SO₂ on a 365-day rolling average basis for FCCUs constructed, reconstructed, or modified after May 14, 2007. The Air District adopted Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units in 2015 to reduce condensable PM emissions. Rule 6-5 does not currently contain SO₂ emission limits, but the role of SO₂ as a PM precursor was recognized during the adoption of Rule 6-5, with the intent of addressing SO₂ in future rule amendments.

Staff's review of existing best available control technology (BACT) guidelines and recent determinations indicates that emission limits of 50 ppmv SO₂ on a seven-day rolling average basis and 25 ppmv SO₂ on a 365-day rolling average basis (equivalent to NSPS Subpart Ja standards for newly constructed, reconstructed, and modified units) have been applied and

¹ SCAQMD, 2003. Final Staff Report – Proposed Rule 1105.1 Reduction of PM10 and Ammonia Emissions from Fluid Catalytic Cracking Units. September 2003.

² EPA, 2008. Regulatory Impact Analysis of the Petroleum Refinery NSPS. April 2008.

achieved at FCCUs and CO boilers. Typical controls include SO₂-reducing catalyst additives or wet gas scrubbers. Based on staff's review, staff has identified a preliminary BARCT level of 50 ppmv SO₂ on a seven-day rolling average basis and 25 ppmv SO₂ on a 365-day rolling average basis. This preliminary BARCT level is used for staff's evaluation of potential BARCT controls, compliance costs, and emissions reductions, but may change as controls are further evaluated.

Potential Emission Reductions and Impacts

Three of the four refineries operating FCCUs currently have permit limits equivalent to the preliminary SO₂ BARCT level, and no further emission reductions or additional controls would be anticipated. One refinery does not currently meet the preliminary BARCT level for FCCUs and CO boilers, and would potentially be required to install a wet gas scrubber or optimize use of enhanced SO₂-reducing catalyst additives. The facility operates a partial burn FCCU and currently utilizes an SO₂-reducing catalyst additive, however recent advances have been made in the performance and efficacy of catalyst additives, specifically for partial burn operating modes. Staff believes there is potential to reduce SO₂ emissions through optimization of these newer catalyst additives and/or use of wet gas scrubbing.

Based on staff's preliminary BARCT level and understanding of current performance of the potentially affected sources, Staff estimates a potential emission reduction of up to 567 tons per year of SO₂. For this preliminary evaluation, staff estimated potential emission reductions and costs for control options involving enhanced catalyst additive optimization and wet gas scrubbing.

Optimized use of enhanced partial burn catalyst additive would result in one-time costs for optimization testing, as well as continued costs of the enhanced catalyst additive. Staff conservatively estimates that optimization testing may result in costs up to \$5 million dollars, and costs of continued addition and use of enhanced catalyst additive may be up to \$1 million dollars per year. Note that these current estimates do not account for any cost savings from reduced additive usage that may occur as a result of the optimization. Based on these estimates, the annualized cost of the control strategy (including amortized optimization costs and operating costs) is estimated at approximately \$1.8 million dollars per year. This would result in a cost-effectiveness of approximately \$4,000 per ton of SO₂. Note that further study is needed to determine if this optimization option would achieve the preliminary BARCT level and associated emission reductions.

Capital and operating costs of wet gas scrubbing would likely have higher total costs compared to other control options. Based on staff's review of wet gas scrubber costs from vendor estimates and previous projects and evaluations, capital costs of a wet gas scrubber are estimated at \$135 million dollars, with the annualized cost of the control system (including amortized capital costs and operating costs) estimated at approximately \$27 million dollars per year. This would result in a cost-effectiveness of approximately \$47,000 per ton of SO₂.

Table 1. FCCUs and CO Boilers SO₂ BARCT Summary

Current Emissions (tpy)	1,044
Potential Emission Reductions (tpy)	567
Preliminary BARCT Level	50 ppmv SO ₂ , 7-day rolling average 25 ppmv SO ₂ , 365-day rolling average
Controls Required	Optimized SO ₂ -reducing catalyst additive; Wet gas scrubber
Total Capital Cost	\$5,000,000 (enhanced catalyst additive) to \$135,000,000 (wet gas scrubber)
Total Annual Cost	\$1,800,000 (enhanced catalyst additive) to \$27,000,000 (wet gas scrubber)
Cost-Effectiveness (\$/ton)	\$4,000 (enhanced catalyst additive) to \$47,000 (wet gas scrubber)

Further Considerations

Optimization of partial burn SO₂-reducing catalyst additives may or may not be able to achieve preliminary BARCT levels. Therefore, estimates of emission reductions and cost-effectiveness for this control option may change with additional testing, research, and study of these sources and enhanced catalyst additives. Further refinements to the evaluation of cost-effectiveness and technological feasibility for both additive optimization and wet gas scrubbing are also needed.

NOx

Regulatory Context and Preliminary BARCT Level

Federal NSPS Subpart Ja includes an emission limit of 80 ppmv NOx for newly constructed, reconstructed, or modified FCCUs. The Air District adopted amendments to Regulation 9, Rule 10: Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries (Rule 9-10) in 2013, which contains NOx limits for non-partial burn CO boilers (150 ppmv on an operating day average, and 45 ppmv on a calendar year average) and partial burn CO boilers (125 ppmv on an operating day average, and 85 ppmv on a calendar year average). Staff's review of existing BACT guidelines and recent determinations indicates that NOx emission levels of 20 ppmv NOx on a 365-day rolling average basis have been achieved at some FCCUs with selective catalytic reduction (SCR) systems and/or low temperature oxidation (LoTOx) controls.

Staff believes that the NOx limits in Rule 9-10 adopted in 2013 reflect BARCT for NOx emissions from FCCUs with CO boilers, and further BARCT evaluation and rulemaking is not anticipated at this time. The FCCU at the Chevron Richmond Refinery does not have a CO boiler, and is therefore not subject to Rule 9-10 NOx limits. However, this FCCU is subject to facility permit limits of 20 ppmv NOx on a 365-day rolling average basis and 40 ppmvd NOx on a seven-day rolling average basis, which are comparable to the BACT levels reviewed. Staff believes that these limits reflect BARCT for NOx emissions from FCCUs, and further BARCT evaluation and rulemaking are not anticipated at this time.

ROG

Regulatory Context and Preliminary BARCT Level

Federal rules NSPS Subparts J and Ja and NESHAP Subpart UUU for FCCUs and CO boilers do not address ROG emissions, although NESHAP Subpart UUU does include limits on total organic hydrocarbon and organic hazardous air pollutant emissions.

Staff's review of existing BACT guidelines and recent determinations indicate that BACT for ROG is typically good combustion practice. Good combustion practices are generally required for complete combustion and control of CO emissions, and staff believes that these sources currently implement these practices. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

Refinery Heavy Liquid Leaks – Rule Development Project Scope

Summary

This rule development project would address emissions of reactive organic gases (ROG) from petroleum refineries, chemical plants, bulk terminals and bulk plants, and other facilities that store, transport and use organic liquids. Amendments to Regulation 8, Rule 18: Equipment Leaks (Rule 8-18) in December 2015 addressed equipment that service heavy liquids at these sources, but those amendments have not yet been fully implemented due to uncertainty regarding proper emissions factors for heavy liquid fugitive emissions. Air District staff is coordinating with each of the five Bay Area refineries to conduct a Heavy Liquid Leak Study. These studies are designed to determine appropriate emission factors for heavy liquid leaks. The results of these studies are expected by Spring 2019. Staff recommends using results of the Heavy Liquid Leak Study to amend Rule 8-18, and address the current issues with the 2015 amendments. Any recommended and implemented requirements to address ROG emissions from these sources are also anticipated to reduce toxic air contaminant (TAC) emissions. Rulemaking for emissions of oxides of nitrogen (NO_x), sulfur dioxide (SO₂), and particulate matter (PM) is not anticipated at this time.

Background

Oil refineries, chemical plants, bulk plants, bulk terminals, and other facilities that store, transport, and use volatile organic liquids may occasionally have leaks wherever there is a connection between two pieces of equipment, and lose some organic material as fugitive emissions. Valves, pumps, and compressors can also leak organic material. Air District Rule 8-18 requires such facilities to maintain a leak detection and repair (LDAR) program.

The purpose of the LDAR program is to ensure that all equipment is inspected regularly and, if a leak is found to exceed the leak threshold, that the equipment is repaired, replaced, or placed on a limited list of non-repairable equipment. Component leaks commonly occur at the joints or connections between sections of piping, at valves, at pumps or from barrier fluid contained between seals, and at leaking pressure relief devices (PRDs).

Rule 8-18 was amended in December 2015 to extend the requirements of the LDAR program to include equipment in hydrocarbon heavy liquid service.¹ Inclusion of heavy liquids is costly because equipment in heavy liquid service expands the LDAR program by approximately one-third more equipment than is currently being monitored. The Heavy Liquid Leak Study was originally projected to be completed within a year. However, completion of the heavy liquid leak study mentioned above has been problematic, because some heavy hydrocarbon liquids are condensing and coating the leak detection sensors. These equipment problems have prevented

¹ Heavy hydrocarbon liquids are defined as having an initial boiling point greater than 302°F.

proper collection of all the data needed. Study participants are re-configuring the study approach, and anticipate having useful data by the Spring of 2019.

ROG

Regulatory Context and Preliminary BARCT Level

The Air District originally adopted Rule 8-18 in 1980, and has amended the rule in 1992, 2004, and 2015. In addition, some minor changes were made to the rule in 1998 and 2002. The original intent of the rule was to control fugitive organic gas leaks from valves and connectors at refineries, chemical plants, bulk plants, and bulk terminals. Rule amendments adopted in 1992 significantly lowered the allowable leak concentration limits to the lowest levels in the country and required more effective inspection and repair programs to reduce emissions and promote self-compliance. The 1992 amendments reduced emissions by an estimated 1.2 tons per day (tpd).

The allowable leak standard is 500 parts per million volume (ppmv) for pumps, compressors, and PRDs.² For valves and other equipment, the allowable leak standard is 100 ppmv. Leaks are detected using a portable combustible gas indicator.

The U.S. Environmental Protection Agency (EPA) standards in 40 CFR parts 60 and 63 include LDAR provisions for monitoring and repairing equipment in heavy liquid service and do not rely on instrument monitoring, but instead rely on “visual, audible, olfactory, or any other detection method.” The concern with visual, audible, and olfactory monitoring is that these methods only identify large leaks (typically 10,000 ppm or more). Instrument monitoring can identify much smaller leaks (in the 100 – 500 ppm range).

Potential Emission Reductions and Impacts

The 2015 emissions inventory estimates that fugitive hydrocarbon leaks from the five refineries in the Bay Area total approximately 1,172 tons per year of ROG based on emission factors at that time. As mentioned previously, uncertainties associated with these heavy liquid leak emission estimates are being evaluated, and staff is currently coordinating with Bay Area refineries to conduct a Heavy Liquid Leak Study to determine appropriate emission factors and refine these estimates. Refined estimates of heavy liquid leak emissions will be quantified based on the results of the Heavy Liquid Leak Study.

Due to the uncertainties associated with emission estimates from heavy liquid leaks, estimates of potential emission reductions from expanded LDAR controls are uncertain at this time. Note that potential emission reductions from expanded LDAR requirements were previously estimated during the development of the 2015 amendments to Rule 8-18. At that time, ROG emissions from heavy liquid leaks were estimated to be approximately 1,476 tons per year, and the 2015 amendments were anticipated to reduce emissions by over 80 percent (1,227 tons per year) based on conservative assumptions of leak occurrences and concentrations in the controlled scenario. As mentioned previously, the need for more certainty regarding heavy liquid

² PRDs are also subject to the requirements of Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants.

emission factors has delayed implementation of the 2015 amendments and has prompted efforts to refine these estimates and the characterization of leaks. Staff anticipates re-evaluating these estimates of potential emission reductions following the completion of the Heavy Liquid Leak Study.

Potential capital and annualized costs for implementation of expanded LDAR requirements were also estimated during the development of the 2015 amendments to Rule 8-18. These cost estimates are included in Table 1 for informational purposes, and will also be re-evaluated following the completion of the Heavy Liquid Leak Study.

Table 1. Refinery Heavy Liquid Leaks ROG BARCT Summary

Current Emissions (tpy)	1,172 tpy
Potential Emission Reductions (tpy)	Uncertain
Preliminary BARCT Level	TBD
Controls Required	LDAR for heavy liquid equipment
Total Capital Cost	\$250,000
Total Annual Cost	\$6,800,000
Cost-Effectiveness (\$/ton)	Uncertain

Further Considerations

Rule 8-18 will require amendments based on results of the Heavy Liquid Leak Study. Therefore, estimates of emission reductions and cost-effectiveness for this control and monitoring may change as the study progresses. Results of the study are also expected to inform health risk analyses required by Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18), so further controls based on implementation of Rule 11-18 may also be taken into consideration when evaluating further rulemaking activity.

Particulate Matter

Heavy liquid leaks do not typically generate substantial PM emissions that would require additional controls. Heavy liquids that may become aerosols (and any toxic air contaminant components) would be controlled by a heavy liquid leak LDAR program for ROG emissions. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

NO_x

Heavy liquid leaks do not typically generate substantial NO_x emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

SO₂

Heavy liquid leaks do not typically generate substantial SO₂ emissions that would require additional controls. Therefore, further BARCT evaluation and rulemaking are not anticipated at this time.

Petroleum Coke Calcining – Rule Development Project Scope

Summary

This rule development project would address oxides of nitrogen (NO_x) emissions from petroleum coke calcining operations. Staff estimates that preliminary BARCT levels could result in significant emission reductions of NO_x; however, NO_x control options for petroleum coke calcining appear limited in practice in the United States. The Air District has not addressed NO_x emissions concerning petroleum coke calcining in previous rule developments. Staff recommends potentially amending Regulation 9, Rule 14: Petroleum Coke Calcining Operations (Rule 9-14), which only address sulfur dioxide (SO₂), to include NO_x emissions if socioeconomic impacts, cost effectiveness, and control technology application can be justified as BARCT. Technologies potentially available for NO_x reduction for this process may not be commercially available nor demonstrated in practice, and therefore may be considered Lowest Achievable Emission Rate (LAER). Rulemaking for emissions of sulfur dioxide (SO₂), reactive organic gases (ROG), and particulate matter (PM) is not anticipated at this time.

Background

Petroleum coke calcining operations in the Bay Area occur only at the Phillips 66 Carbon Plant. It is one of two such facilities in California; the other facility is located in Southern California. The Carbon Plant processes green coke from the Phillips 66 San Francisco Refinery to purify it and sell it to industry that is primarily offshore. The facility commenced calcining operations with a single kiln in 1960, and a second kiln was added to the facility in 1968. The Carbon Plant sells the majority of its calcined coke to a single company that uses the refined coke to produce titanium dioxide, which is a photocatalyst commonly used to manufacture white pigments that are incorporated into a wide range of applications, including skincare products, plastics, food coloring, paint, and coating products.

Phillips 66 Carbon Plant Operations

The Phillips 66 Carbon Plant operates two process trains that include a natural gas kiln burner with a rating of approximately 60 million British thermal units (MMBtu/hr) each, and that have a combined permitted maximum coke throughput of 250 tons per hour. Each train includes a pyroscrubber and baghouse with a separate exhaust stack. Annual production is limited to 262,800 tons of coke produced per train.

Petroleum coke is received from the Phillips 66 Refinery coker and is stored on-site at the Carbon Plant. Coke is conveyed to the coke calciner where it is calcined (heated). This process removes impurities from the coke, including sulfur and volatiles. The hot waste gases from the calciner are sent to the pyroscrubber that removes particulates through a combination of settling and incineration. Sulfur compounds are oxidized to SO₂. The hot waste gases are sent to a heat recovery steam generator to produce steam for the generation of electricity. The cooled waste gases pass through a baghouse and tall stack and are emitted into the atmosphere. The resulting calcined coke is then sold.

Petroleum Coke

Petroleum coke is a carbon by-product that remains from petroleum refining processes. It is a black solid residue that results from the thermal processing of petroleum derived from feedstocks, tar, pitch, or vacuum tower bottom blends that have been cracked or otherwise processed in a coker to remove low boiling fractions. Coke consists mainly of carbon (90 to 95 percent) and is created by heat-treating the residual oil (more accurately described as tar) to a temperature high enough to polymerize it to form a non-melting solid carbonaceous material.

Coke is used as a feedstock in coke ovens for the steel industry, for heating purposes, for electrode manufacturing, and for the production of chemicals. Coke, as it is removed from the petroleum coking process, is referred to as “green coke.” Green petroleum coke may contain approximately 15 to 20 percent residual hydrocarbon materials. Such hydrocarbons are compounds that do not polymerize in the coke cracking process and cannot be removed from the coke substrate due to process limitations. Thus, green coke is calcined to remove hydrocarbons and other impurities to make it a more marketable product.

Calcining Process

Calcined petroleum coke is manufactured by heating green coke in a rotary kiln to a temperature that ranges between approximately 2,200 to 2,500 degrees Fahrenheit (°F). This roasting process combusts virtually all of the residual hydrocarbons and also removes sulfur compounds and moisture from the coke. The coke’s crystalline structure is refined and thus enhances the coke’s physical properties such as electrical conductivity, density and oxidation characteristics. A rotary kiln is a long, refractory lined cylindrical device that rotates on its own axis and drives off contaminants from the green coke by bringing the contaminants into direct contact with heated gas. As the petroleum coke slides down the rotating kiln it flows counter-current to the rising hot combustion gas produced by burning natural gas.

NO_x

Regulatory Context and Preliminary BARCT Level

The purpose of a new rule would be to reduce NO_x emissions from petroleum coke calciners located in the Air District. NO_x emissions from gas-fired combustion kilns result primarily from oxidation of atmospheric nitrogen during the combustion of natural gas and coke fines. NO_x formation is favored when both high combustion temperatures and high excess oxygen (O₂) levels are present. Thermal NO_x formation increases exponentially as a function of temperature, with the rate of formation rising very rapidly at temperatures above about 2,400 °F. NO_x can also be formed if nitrogen is present in the fuel. Currently, there are no federal or Air District NO_x requirements applicable to petroleum coke calcining operations.

When the Phillips 66 Carbon Plant calcines green coke under fully operational conditions, the total NO_x emissions are approximately 2,000 pounds per day; this translated to approximately 350 tons per year in 2015. In previous years, NO_x emissions from the facility have exceeded 500 tons per year. Staff believes that substantial reductions of NO_x emissions may be achievable, however research of potential control options is ongoing, and a preliminary BARCT

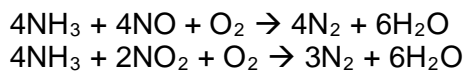
level is still under development. Potential control technologies are discussed in the section below.

Further Considerations

NOx control for petroleum coke calcining operations appears to be unproven and not necessarily commercially available. There were no best available control technology (BACT) determinations for NOx emissions found for the process in the United State Environmental Protection Agency RBLC¹ database. However, South Coast Air Quality Management District (SCAQMD) published a 2000 BACT guideline for NOx at 44 ppmvd at 3 percent O₂. Further research is needed to determine if possible control options have been achieved in practice in SCAQMD or other parts of the US. Typical NOx control options include selective catalytic reduction (SCR) and LoTOx, which may be considered by some as a LAER control for this process.

SCR

SCR is a post-combustion control technology that, for combustion unit applications, typically employs ammonia (NH₃) in the presence of a catalyst to convert NOx to nitrogen and water according to the following overall reactions:



An SCR system typically utilizes an injection grid to evenly disperse the NH₃ into the combustion unit exhaust gas upstream of a catalyst. The function of the catalyst is to lower the activation energy of the NH₃-NOx reduction reactions. Operating temperatures between 500 °F and 800 °F are often required of the gas stream at the catalyst bed. NOx removal rates can exceed 90 percent with a well-designed system.

SCR has been successfully installed at a petroleum coke calcining facility in Germany, however additional firing was required to heat the gases back up to 500 °F prior to flow through the SCR catalyst bed, increasing GHG emissions.

Additional study of this control option would be required to appropriately evaluate this control strategy and achievable BARCT limits. Further considerations of efficacy, feasibility, and cost-effectiveness would need to be analyzed on a site-specific basis. Draft and final proposed BARCT limits may change throughout the rule development process as additional testing, research, and evaluation is conducted.

LoTOx

In the LoTOx system, ozone is injected into the flue gas stream and oxidizes insoluble NOx to soluble oxidized compounds. LoTOx is a low temperature system; therefore, it does not require heat input to maintain operational efficiency or to prevent the “slip” of treatment chemicals (such as ammonia), as is common with SCR and selective non-catalytic reduction (SNCR) systems.

¹ RACT/BACT/LAER Clearinghouse

Ozone rapidly reacts with insoluble nitric oxide (NO) and nitrogen dioxide (NO₂) molecules to form soluble dinitrogen dioxide (N₂O₂). The species N₂O₂ is highly soluble and will rapidly react with moisture in the gas stream to form nitric acid. The conversion of NO_x into the aqueous phase in the scrubber is rapid and irreversible, allowing nearly complete removal of NO_x. The nitric acid, along with unreacted N₂O₂ and nitrous acid formed by reaction of NO₂ with water, can be easily scrubbed out of the gas stream in a wet scrubber with water or neutralized with a caustic solution.

Additional study of this control option would be required to appropriately evaluate this control strategy and achievable BARCT limits. Increased water use associated with the LoTOx system would need to be evaluated, as substantial water consumption may be a concern. Additional research is also required to determine commercial availability for this application. Further considerations of efficacy, feasibility, and cost-effectiveness would need to be analyzed on a site-specific basis. Draft and final proposed BARCT limits may change throughout the rule development process as additional testing, research, and evaluation is conducted.

SO₂

Regulatory Context and Preliminary BARCT Level

In April 2016, Air District Rule 9-14 was promulgated limiting SO₂ emissions from petroleum calcining operations. Staff believes that these limits reflect BARCT for SO₂, and further BARCT evaluation and rulemaking is not anticipated at this time.

ROG

Regulatory Context and Preliminary BARCT Level

Natural gas fired pyroscrubbers control ROG emissions. The main function of a pyroscrubber in petroleum coke calcining process is to oxidize the carbonaceous contents, including hydrocarbon volatiles, of the exhaust gas from the coke calcination kiln. Staff believes that this level of control reflects BARCT for ROG at the source, and further BARCT evaluation and rulemaking is not anticipated at this time.

Particulate Matter

Regulatory Context and Preliminary BARCT Level

Natural gas fired pyroscrubbers and baghouses are located on each train to control PM emissions. Current permit requirements include keeping the baghouses in good operating condition, meeting 12-month rolling average PM limits, and incorporating monitoring and recordkeeping as specified per the Title V operating permit conditions. Staff believes that this level of control reflects BARCT for PM at the source, and further BARCT evaluation and rulemaking is not anticipated at this time.

Summary of Comments and Responses on Proposed AB 617 Expedited BARCT Implementation Schedule and Staff Report

List of Commenters

Abbreviation	Commenter / Reference
CBE	Camille Stough, Communities for a Better Environment, Email, December 7, 2018
Shell	Gordon Johnson, Shell Oil Products, US – Martinez Refinery, Email, December 7, 2018
West Marin Standing Together and 350 Bay Area	W. Ellen Sweet, West Marin Standing Together, and Richard Gray, 350 Bay Area, Letter, December 7, 2018

Responses to Comments

Comment 1.1: CBE renews its request for prompt action on BARCT rules for FCCUs, including a public hearing set no later than June of 2019 and completion of the rulemaking process as soon as possible thereafter. It is critical that BARCT for FCCUs be implemented as soon as possible.

CBE

Response 1.1: The Air District agrees that addressing emissions from FCCUs is a priority, and has accordingly included this rule development project in the Expedited BARCT Implementation Schedule for further evaluation and potential rulemaking. As discussed in the Staff Report, at least 12 months are typically needed in the rulemaking process, and additional time is often needed for projects that require more complex technical assessment efforts. This robust rulemaking process is needed to properly develop rules and support the findings and considerations required for the rule adoption under the California Health and Safety Code. Furthermore, given the complex nature of condensable PM formation and control, the Air District anticipates that rule development for addressing these emissions will require additional research, testing, and outreach beyond a typical rule development timeline. Air District staff believes the anticipated timeline for FCCU rule development activity in the proposed BARCT Schedule appropriately reflects the need to achieve BARCT level controls as soon as feasible and the need to conduct additional testing, research, outreach, and evaluation to support the rule development process.

Comment 1.2: Emissions from FCCUs cause severe and irreversible harm to our air quality, climate, health, and economy.

CBE

Response 1.2: The Air District agrees that FCCUs can be substantial sources of emissions, and have included these sources in the Expedited BARCT Implementation Schedule for further evaluation and potential rulemaking to address these emissions.

Comment 1.3: Proven effective technology is already available and feasible for priority emitting FCCUs.

CBE

Response 1.3: The Air District acknowledges that control technology exists that can substantially reduce emissions from FCCUs, and intends to evaluate various control options in the determination of BARCT. These analyses are part of the normal rule development process, which also includes conducting all analyses necessary to support the findings and considerations required for the adoption of new rules and amendments under the California Health and Safety Code.

Comment 1.4: The California Air Resources Board formally confirmed support of the District taking immediate action to develop BARCT rules for FCCUs.

CBE

Response 1.4: The Air District acknowledges and appreciates the resolution adopted by the California Air Resources Board in support of the acceleration of BARCT rule development for refinery sources. The anticipated rule development timelines included in the proposed Expedited BARCT Implementation Schedule reflect those included in the resolution, and staff believes that the proposed schedule is appropriate given the need to achieve BARCT level controls as soon as feasible, and the need to conduct additional testing, research, outreach, and evaluation to support the rule development process.

Comment 2.1: To develop an effective rule, additional studies are needed to accurately characterize any potential PM emission reductions.

Shell

Response 2.1: The Air District agrees and acknowledges that condensable PM requires additional study and characterization, and discusses this in the staff report and FCCU and CO boiler rule development project scope. The analyses conducted to inform the development of the Expedited BARCT Implementation Schedule are preliminary and the Air District intends to refine and expand upon these assessments during the development process for the individual rulemaking efforts.

Comment 2.2: Since the area is in attainment of SO₂ and non-attainment of PM standards, the cost-effectiveness should be based on PM emission reductions (which again cannot be accurately determined without further study).

Shell

Response 2.2: The analyses conducted to inform the development of the Expedited BARCT Implementation Schedule are preliminary and the Air District intends to refine

and expand upon these assessments during the development process for the individual rulemaking efforts. The Air District agrees that further study is needed to estimate the potential condensable PM reductions that may be achieved through reduction in SO₂ emissions, and discusses this in the rule development project scope. Through the rule development process, the Air District considers and evaluates what cost-effectiveness basis is appropriate to inform the rulemaking efforts. The Air District notes that precursor emission reductions have been used as the basis for cost-effectiveness in other cases, such as rulemakings that address ozone issues through the reduction of the ozone precursors NO_x and VOC.

Comment 2.3: The proposed SO₂ limits are based on BACT guidelines and NSPS, both of which are for newly constructed, reconstructed, and modified units. However, BARCT applies to the retrofit of existing units not being reconstructed or modified so the proposed limits are not appropriate.

Shell

Response 2.3: The Air District acknowledges that BARCT levels are often different than BACT levels, as retrofit control levels for existing sources may be more constrained by economic and feasibility issues compared to those for new sources. BARCT is defined as an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts (H&SC Section 40406). Therefore, it is appropriate to examine more stringent levels of reduction, such as BACT, as part of the evaluation to determine this maximum degree of reduction achievable. The Air District acknowledges that environmental, energy, and economic impacts that must also be considered when determining BARCT; these considerations are discussed in the staff report and project scope, and the Air District intends to refine and expand upon these assessments during the development process for a proposed rule and proposed BARCT limit. The Air District also notes that the levels identified in the project scope have been achieved at other existing FCCUs in the state and the San Francisco Bay Area.

Comment 2.4: The actual costs for retrofitting an existing FCCU/CO Boiler with a WGS are significantly greater than estimated by BAAQMD.

Shell

Response 2.4: The analyses conducted to inform the development of the Expedited BARCT Implementation Schedule are preliminary and the Air District intends to refine and expand upon these assessments during the development process for the individual rulemaking efforts. As stated in the project scope, the preliminary cost estimates are based on staff's initial review and assessment of vendor cost estimates, previous projects, and engineering evaluations, and staff intends to further evaluate costs, cost-effectiveness, and feasibility during the rule development process. The project scope discusses further considerations and issues that would be explored during this process, which includes additional efforts to develop refined cost and cost-effectiveness estimates for various control options.

Comment 2.5: WGS would result in higher energy consumption, greater GHG emissions, increase water usage, and greater liquid and solid waste generation.

Shell

Response 2.5: The Air District acknowledges that the installation and operation of wet gas scrubbers may result in environmental impacts. The Air District evaluated and described these potential impacts in the EIR for the Expedited BARCT Implementation Schedule, and analyzes the potential environmental impacts of proposed rules and amendments as part of its normal rulemaking process. These impacts are considered during the development of a rule and prior to adoption of a rule. The Air District intends to analyze environmental impacts as appropriate during the rule development process for FCCUs and CO boilers.

Comment 2.6: Additional studies would be needed to determine the potential emission reductions and cost effectiveness of catalyst additives.

Shell

Response 2.6: The Air District agrees and acknowledges that additional study is needed to evaluate SO₂-reducing catalyst additives, as well as other potential control options. These additional considerations and areas of work are described in the staff report and FCCU and CO boiler rule development project scope, and will be further assessed during the rule development process.

Comment 3.1: Two more years of no control of FCCU PM_{2.5} emission is unacceptable, in light of the ongoing critical community health impacts of refinery particulate emissions. We request that emissions reductions from FCCUs begin immediately under adopted Rule 6-5 and not be delayed for another two years under the AB 617 BARCT Implementation Schedule.

West Marin Standing Together and 350 Bay Area

Response 3.1: The Air District agrees that addressing emissions from FCCUs is a priority, and has accordingly included this rule development project in the Expedited BARCT Implementation Schedule for further evaluation and potential rulemaking. The Air District notes that implementation of the currently adopted Rule 6-5 is ongoing, and those emission reduction efforts are not being delayed. As shown in the proposed Schedule, further rule development activity for FCCUs is anticipated to start in Q1 2019. As discussed in the Staff Report, at least 12 months are typically needed in the rulemaking process, and additional time is often needed for projects that require more complex technical assessment efforts. This robust rulemaking process is needed to properly develop rules and support the findings and considerations required for the rule adoption under the California Health and Safety Code. Furthermore, given the complex nature of condensable PM formation and control, the Air District anticipates that rule development for addressing these emissions will require additional research, testing, and outreach beyond a typical rule development timeline. Air District staff believes the anticipated timeline for FCCU rule development activity in the proposed BARCT

Schedule appropriately reflects the need to achieve BARCT level controls as soon as feasible and the need to conduct additional testing, research, outreach, and evaluation to support the rule development process.



December 7, 2018

BY ELECTRONIC MAIL

Jack Broadbent, Air Pollution Control Officer
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attention:

David Joe, Senior Air Quality Engineer
Air District Board Members, c/o Marcy Hiratzka, Clerk of the Boards

Comments on AB 617 Expedited BARCT Implementation Schedule regarding fluidized catalytic crackers

Communities for a Better Environment (“CBE”) submits these comments regarding the proposed expedited schedule for adoption of best available retrofit control technology (“BARCT”) rules mandated by Assembly Bill 617. The District’s proposed schedule now starts the rulemaking process for BARCT implementation for fluidized catalytic cracking units (“FCCUs”) by the first quarter of 2019. Yet the proposed schedule continues to set an unreasonable extended time of completion of BARCT rules for FCCUs over a two-year stretch, with adoption by the end of 2020.¹ CBE renews its request for prompt action on BARCT rules for FCCUs, including a public hearing set **no later than June of 2019** and completion of the rulemaking process as soon as possible thereafter.

CBE has repeatedly underscored the urgency in addressing the detrimental public health and environmental impacts of FCCUs with proven effective control technology.² **It is critical that BARCT for FCCUs be implemented as soon as possible.** This means not providing for an unnecessary two-year rulemaking process to determine which control technology should be

¹ Figure 1. Expedited BARCT Implementation Schedule. BAAQMD Assembly Bill 617 Expedited BARCT Implementation Schedule, Initial Staff Report (October 2018).

² CBE attaches hereto its latest comments, dated October 5, 2018, which includes previous comments and attachments discussing impacts of FCCUs, proven effective control technology via wet scrubbing, and other relevant information supporting an expedited process for BARCT implementation for FCCUs. (Attachment.)

implemented, especially when proven effective technology is already available and feasible for priority emitting FCCUs.

Our communities have waited far too long for abatement of these heavily polluting units that have been in operation as early as the 1940s. There is no reason for the delay, and proven technology has already demonstrated an effective means to protecting public health and the environment. CBE urges the District to adopt a real expedited schedule that actually addresses the urgency and concerns of residents who have had to bear the brunt of toxic air quality for decades.

Respectfully,

A handwritten signature in black ink, appearing to read "Camille Stough". The signature is fluid and cursive, with a long horizontal stroke at the end.

Camille Stough
Staff Attorney

Attached:
CBE Comments, dated October 5, 2018, with attachments.

**ATTACHMENT TO CBE COMMENTS ON AB 617 EXPEDITED BARCT IMPLEMENTATION
SCHEDULE – DECEMBER 7, 2018**

October 5, 2018



BY ELECTRONIC MAIL

Jack Broadbent, Air Pollution Control Officer
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attention:

David Joe, Senior Air Quality Engineer
Air District Board Members, c/o Marcy Hiratzka, Clerk of the Boards

Comments on AB 617 Expedited BARCT Implementation Schedule regarding fluidized catalytic crackers

Communities for a Better Environment (“CBE”) submits these comments regarding the proposed schedule for adoption of rules mandated by Assembly Bill 617 (2017, C. Garcia). As an initial matter, CBE strongly reasserts its August 16, 2018 comments calling on the Bay Area Air Quality Management District (“District”) to **stop the needless and long unabated pollution from fluidized catalytic cracking units (“FCCUs”) by prompt implementation of proven least-emitting technology.**¹ The District’s draft expedited implementation schedule for Best Available Retrofit Control Technology (“BARCT”) proposes an unreasonable timeline for developing and adopting FCCU rules, commencing the rulemaking process in the second half of 2019 with final adoption in 2021.² Waiting until 2021 is unacceptable and contravenes AB 617’s mandate.

For reasons described below, BARCT rule development for FCCUs must begin now.

I. Emissions from FCCUs cause severe and irreversible harm to our air quality, climate, health, and economy.

As described in CBE’s September 20, 2018 letter, there is absolutely no dispute that gradually reducing petroleum usage, and thus refining rates, is feasible and necessary to prevent severe and irreversible harm to our air quality, climate, health, and economy.³ Moreover, FCCUs emit more PM_{2.5} than any other oil refining process, while oil refining as a whole is the biggest

¹ CBE-BAAQMD Comments on Proposed Amendments to Rule 6-5, dated August 16, 2018 (Attached).

² Figure 1. Expedited BARCT Implementation Schedule. BAAQMD Assembly Bill 617 Expedited BARCT Implementation Schedule, Initial Staff Report (September 2018).

³ CBE-BAAQMD Comments on Proposed Amendments to Rules 6-5, 8-18, and 10-11, dated September 20, 2018 (Attached).

source and worst polluter of PM_{2.5} in the District's jurisdiction. Indeed, the District itself has estimated that PM_{2.5} causes 90% of premature deaths associated with air pollution and kills 2,000-3,000 Bay Area residents each year.^{4,5} Every day delaying a rule mandating reductions in PM_{2.5} emissions from FCCUs results in lives lost. Time is certainly of the essence.

II. Proven effective technology is already available and feasible for priority emitting FCCUs.

AB 617 requires that the highest priority be given to sources that have not modified emissions-related permit conditions for the greatest period of time.⁶ The District's own data support an extremely high priority for FCCUs at the Shell, Chevron, and Marathon refineries. These refineries run unabated units that have been in operation since 1966, 1958, and 1945, respectively. The District must prioritize adoption of BARCT rules for FCCUs as the oldest emitting sources that have yet to be abated.

Furthermore, proven technology already exists. Wet scrubbing has been demonstrated to effectively control PM_{2.5} and SO_x emissions as confirmed from the 2011 installation of this technology at the FCCU at the Valero Benicia Refinery. In fact, the District's own emission inventory data reveal that wet scrubbing cuts PM_{2.5} and SO₂ emission rates by as much as **99%**.⁷ Given available proven and effective technology, determination of what technology to implement is no reason to delay the adoption of BARCT rules for FCCUs.

III. The California Air Resources Board formally confirmed support of the District taking immediate action to develop BARCT rules for FCCUs.

Expediting adoption of BARCT for FCCUs should be of no surprise to the District especially because both the District and the Air Resources Board recently committed to expediting these rules beyond what is proposed in the District's BARCT implementation schedule. On September 27, 2018, the Air Resources Board adopted a resolution supporting the District's plan to "accelerate adoption of refinery BARCT rules to reduce emissions in fence-line communities (Rule 6-5 Particulate Emissions from Refinery Fluidized Catalytic Cracking Units [...] with rule development to start in the **first quarter of 2019**...."⁸ Moreover, at the September 27, 2018 meeting, Mr. Broadbent confirmed that the District is "prepared to expedite this based on community concerns."

⁴ *Understanding Particulate Matter*; BAAQMD public report; 2012. See esp. page 26.

⁵ See Fairly and Burch, 2016. Multi-Pollutant Evaluation Method Technical Document 2016 Update; documentation for the State Implementation Plan for the Bay Area Air District on 19 April 2017. Bay Area Air Quality Management District: San Francisco, CA.

⁶ Health and Safety Code section 40920.6(c)(3).

⁷ See CBE Comments on Draft CARB AB 617 Blueprint, dated July 23, 2018, pp. 12-14 (Attached).

⁸ *Assembly Bill Community Air Protection Program – Community Selection*, Resolution 18-37, dated September 27, 2018 (https://www.arb.ca.gov/board/res/2018/res18-37.pdf?_ga=2.17321339.314471624.1538764019-1715844232.1512592943).

AB 617 requires that BARCT be implemented by the “earliest feasible date.”⁹ The earliest feasible date for implementation relies on when the District begins the rule development process. The District has provided no explanation in its proposed BARCT implementation schedule as to why it would delay the process to later in 2019, or why it would take over two years to adopt the rules. CBE expects that the discussions at the September 27, 2018 CARB meeting and the resolution that resulted from those discussions reflect a true commitment from the District in beginning the process as soon as possible, or at the latest, in the first quarter of 2019.

To frontline communities, delaying implementation of FCCU rules for another three years is the same as failing to act at all to protect the public’s health. We cannot hold our breath for that long. There is no reason for the delay, and proven technology has already demonstrated an effective means to protecting our health.

We urge you to adopt an expedited schedule as supported by the Air Resources Board and incorporate the expedited timeline into the District’s AB 617 BARCT implementation schedule.

Respectfully,



Camille Stough
Staff Attorney

⁹ Health and Safety Code section 40920.6(c)(1).

**ATTACHMENTS TO CBE COMMENTS ON AB 617 EXPEDITED BARCT IMPLEMENTATION
SCHEDULE – OCTOBER 5, 2018**

- 1) CBE-BAAQMD Comments on Proposed Amendments to Rule 6-5 (August 16, 2018), referenced in footnote 1
- 2) CBE-BAAQMD Comments on Proposed Amendments to Rules 6-5, 8-18, and 10-22 (September 20, 2018), referenced in footnote 3
- 3) CBE Comments on Draft CARB AB 617 Blueprint (July 23, 2018) with Attachment, referenced in footnote 7

BY ELECTRONIC MAIL

16 August 2018

Jack Broadbent
Air Pollution Control Officer
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attention:

Air District Board members
Victor Douglas
Guy Gimlen

350 Bay Area
350 Marin
350 San Francisco
All Positives Possible
Asian Pacific Environmental Network
Benicians for a Safe and Healthy Community
Center for Biological Diversity
Citizen Air Monitoring Network
Communities for a Better Environment
Community Science Institute
Crockett-Rodeo United to Defend the Environment
Fresh Air Vallejo
Friends of the Earth
Greenaction for Health and Environmental Justice
Idle No More SF Bay
Interfaith Climate Action Network of Contra Costa
Oakland Climate Action Coalition
Richmond Progressive Alliance
Sierra Club – San Francisco Bay Chapter
Stand.Earth
Sunflower Alliance
System Change not Climate Change – Bay Area
The Climate Mobilization
West Berkeley Alliance for Clean Air and Safe Jobs
West Marin Standing Together

Air District-Oil Refiners Agreement Threatening Maximum Feasible cPM (PM_{2.5}) and Sulfur Dioxide (SO₂) Emission Cuts from Fluid Catalytic Cracking (FCC); Notice of Preparation (NOP) and Initial Study (IS) on Rule 6-5 Amendments

Air Pollution Control Officer Broadbent,

By this letter our 25 organizations call on you to stop the deadly, unjust and needless pollution from fluid catalytic cracking (FCC) that remains unabated by proven least-emitting technology at the Chevron, Marathon (formerly Tesoro), and Shell refineries. We demand that the District:

Propose an amendment to Rule 6-5 that requires FCC emissions of condensable particulate matter (cPM; a type of PM_{2.5}) and sulfur dioxide (SO₂; a PM_{2.5} precursor) to be limited consistent with emission reductions that can be achieved by wet scrubbing.

Schedule a public hearing of the Board on Rule 6-5 to commence as soon as possible.

The NOP and IS reveal an agreement with three refiners you signed on 28 March 2017, but fail to mention that it commits you to propose and advocate changes to Rule 6-5 that could exempt refiners from using proven, least-emitting FCC wet scrubbing technology.

Fluid catalytic cracking (FCC) emits more PM_{2.5} than any other process in oil refining, which emits more PM_{2.5} than any other industry in your jurisdiction. Among other serious health impacts, PM_{2.5} causes 90% of premature deaths associated with air pollution and kills 2,000–3,000 Bay Area residents each year. This is based on the District's own data and estimates. Peer reviewed research and independent expert opinion confirm that impacts of refinery PM_{2.5} emissions are disparately severe in low-income communities of color near refineries.

continued

Jack Broadbent
16 August 2018
Page two

Proven technology can cut FCC emissions dramatically. FCC emission wet scrubbing is demonstrated in practice, notably at the Benicia refinery, where a wet scrubbing retrofit has operated for years. Publicly available District data on Benicia, Martinez, and Richmond FCC emissions suggest this proven technology can cut PM_{2.5} and SO₂ emissions from the Chevron, Marathon and Shell FCCs by as much as 99%. And by replacing higher-emitting electrostatic precipitators (ESPs), wet scrubbing can eliminate the explosion hazard of ESP sparking, preventing the recurrence of disasters like the 2015 Torrance FCC explosion. This proven, least-emitting, solution is *inherently* safer for refinery workers and communities.

The agreement you signed with oil refiners in March 2017 threatens to gut a requirement that could achieve this solution. It commits you to propose and advocate an approach to amending Rule 6-5 that considers removing any obligation to establish, enforce, or comply with cPM and SO₂ emission limits achievable by the least-emitting proven control technology. Without those limits, FCC wet scrubbing would not be required.

District staff has concealed this threat from the public, and apparently, from the State Air Resources Board. Instead of revealing the substantive amendments to Rule 6-5 your 2017 agreement contemplates, your NOP and IS characterize them as only clarifications of the rule's original intent. Meanwhile, environmental justice groups are informed that the Air District has assured the Air Resources Board it need not include FCC wet scrubbing in its AB 617 Blueprint because District implementation of this measure (supposedly) is on track.

Finally—because your agreement with refiners commits you to advocate a particular set of Rule 6-5 amendments regardless of evidence yet to emerge in any public hearing, and because this is the law—our representatives on the District Board must exercise independent judgement in their decision on this rule. Our requests of you, stated above, seek your cooperation in support of the Board's independent judgment. We believe the agreement does not preclude the actions we request, that its November 1st deadline now allows barely enough time for a Board hearing process, and that further delay would be unacceptable. Lives are at stake.

Laura Neish
350 Bay Area

Richard Gray
350 Marin

John Anderson
350 San Francisco

Katherine Black
Benicians for a Safe and Healthy Community

Hollin Kretzmann
Center for Biological Diversity

Ken Szutu
Citizen Air Monitoring Network

continued

Jack Broadbent
16 August 2018
Page three

Camille Stough
Communities for a Better Environment

Denny Larson
Community Science Institute

Nancy Reiser
Crockett-Rodeo United to Defend the Environment

Peter Brooks
Fresh Air Vallejo

Marcie Keever
Friends of the Earth

Bradley Angel
Greenaction for Health and Environmental Justice

Pennie Opal Plant
Idle No More SF Bay

Rev. Will McGarvey
Interfaith Climate Action Network of Contra Costa

Colin Miller
Oakland Climate Action Coalition

Jeff Kilbreth
Richmond Progressive Alliance

David McCoard
Sierra Club – San Francisco Bay Chapter

Matt Krogh
Stand.Earth

Steve Nadel
Sunflower Alliance

David F. Gassman
System Change not Climate Change – Bay Area

Armando Davila
The Climate Mobilization

Janice Schroeder
West Berkeley Alliance for Clean Air and Safe Jobs

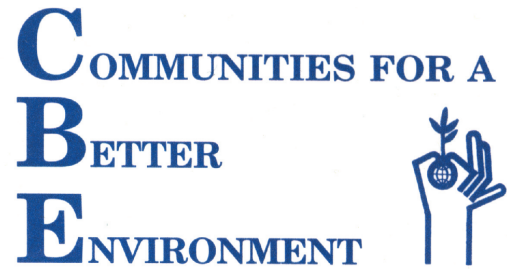
W. Ellen Sweet
West Marin Standing Together

Miya Yoshitani
Asian Pacific Environmental Network

LaDonna Williams
All Positives Possible

20 September 2018

Jack Broadbent, Air Pollution Control Officer
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105



Attention: Guy Gimlen

**Proposed Amendments to Oil Refinery Emission Control Rules 6-5, 8-18, and 10-11:
Initial Staff Report and Proposed Rule Markups Received 20 August 2018.**

Air Pollution Control Officer Broadbent,

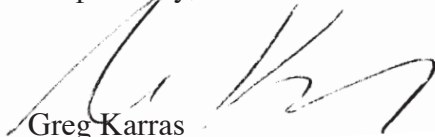
CBE reasserts our 16 August 2018 comments in this matter of Environmental Justice. Note that we still await the Environmental Impact Report mentioned in your Initial Staff Report.

It is beyond reasonable dispute that gradually reducing petroleum usage and thus refining rates is feasible and necessary to prevent severe and irreversible harm to our air quality, climate, health, *and* economy—and that doing so will cut harmful emissions targeted by rules 6-5, 8-18, and 11-10. A second measure, wet scrubbing of catalytic cracking emissions, is demonstrated in practice. Gradually cutting refinery oil feed rates will cut pollution created by coke combustion in catalytic cracking, reducing wet scrubbing rates over time to mitigate side-effects of wet scrubbing. And because it involves re-sizing equipment to run efficiently at lower rates, gradually cutting oil feed rate creates just transition jobs for refinery workers. Amending rules 6-5, 8-18, and 11-10 to require emission cuts achievable by these two measures is therefore necessary, feasible, and cost effective.

Any valid reconsideration of the rules must disclose these facts, assess them, and consider amendments that ensure these necessary, feasible, cost-effective protections. Unfortunately, further demonstrating the bias created by your March 2017 agreement with refiners that commits you to advocate weakening these rules, your Initial Staff Report, rule proposals, and CEQA documentation propose to weaken these rules while failing to disclose, describe, analyze or address these facts.

We believe your current proposal threatens to violate the Air District's mission and the law. We ask you instead to propose amendments to rules 6-5, 8-18 and 10-11 based on all necessary, feasible and cost-effective criteria air pollutant emission control measures.

Respectfully,



Greg Karras
Senior Scientist

Copy: Interested organizations and individuals

120 Broadway, Suite 2 • Richmond, CA 94804 • T (510) 302-0430 • www.CBECAL.org
In Southern California: 6325 Pacific Blvd., Suite 300 • Huntington Park, CA 90255 • (323) 826-9771

7/23/2018

California Air Resources Board (CARB)

Submitted online at:

<https://www.arb.ca.gov/lispub/comm/bclist.php>



Re: CBE Comments on Draft Community Air Protection Blueprint pursuant to AB 617; Need Strong State Mandated Refinery, Transportation, and Small Cumulative Source Cuts

Honorable Air Resources Board Boardmembers and Staff,

CBE is a statewide Environmental Justice (EJ) organization based in Southern and Northern California urban communities heavily impacted by fossil fuel air pollution sources, including **Wilmington** (Oil Refineries, drilling, Ports/trucking), **Richmond/Rodeo** (oil refineries, superfund sites), **Southeast Los Angeles (Huntington Park and surrounding areas, with heavy transportation and stationary sources), and East Oakland** (Port/trucking, and stationary sources). All these communities have high CalEnviroScreen scores for disproportionate impacts, and were previously nominated for high priority by CBE and many others. CBE is also a member of CEJA (the California Environmental Justice Alliance), with impacted communities throughout both urban and rural California deserving strong pollution prevention measures.

We opposed AB617 adoption, as it was used to justify extending pollution trading, which harms our communities. Because of this, many EJ communities are frankly disengaged from AB617, and without confidence in the ongoing process. Nevertheless, CBE is working through implementation to secure improvements, which are achievable. We need strong state-mandated emissions cuts in the Blueprint that are *additional* to existing Air District measures; otherwise AB617 would be without purpose. Currently the Draft Blueprint is over-generalized and leaves out major sources (including oil refineries).

We understand AB617 added tough deadlines to staff responsibilities. But CARB must correct the perverse outcome that AB617 has been used to *delay* emission cuts previously poised for adoption regionally (such as the Bay Area regional Refinery PM Cap). **Adding administrative burdens without mandating emission cuts leaves communities worse off, but CARB can correct this by adding state-mandated emissions cuts in the Final Blueprint.** Monitoring is also important, but not as a barrier or replacement for cutting emissions. Our comments on Refineries, Transportation, and Cumulative Smaller Sources are summarized immediately below; also see our full letter below for additional comments and recommendations:

OIL REFINERIES:

- **The 617 Blueprint has no emission cuts for refineries – the largest, and expanding industrial sources.** (This is despite AB 617 being adopted to address co-pollutants of Cap & Trade sources).
- Refineries receive sweetheart deals from Air Districts; communities need recourse.
- **Communities need state mandates for measures to cut pollution which are *additional* to regional regulations,** including state mandated refinery Boiler and Heater replacements, Best Catalytic Cracking Unit PM2.5 and SOx controls, and ensuring no emission increases (see below).
- **The state must recognize it needs a long-term Just Transition Plan to phase down Oil Refineries and Oil extraction in favor of clean renewable transportation, instead of continuing expansion.** Without a plan, state clean air and greenhouse goals will never be met.

TRANSPORTATION: In addition to large industrial sources, pollution from transportation of people and goods are a major source of pollution in most low-income communities of color.

- **ARB must use the mandate of AB 617 for setting aggressive targets in transportation electrification and enhancing clean mobility.** We applaud ARB's work in proposing Innovative Clean Transit.
- **ARB needs to replicate similar and technology forcing programs in other transportation categories related to movement of goods.**
- **Additionally ARB needs to issue clear guidance documents for agencies such as Caltrans that undertake expansion of freeways such as I-710.** For years community leaders, public health experts and environmental advocates have asked Caltrans to create a zero emission lane as part of I-710 expansion project, and ARB has the obligation to show how this massive infrastructure project could advance the zero emission programs in California and help California and the South Coast region achieve some of its climate and air quality targets.
- Furthermore ARB needs to provide similar guidance documents for the Ports of LA, Long Beach and Oakland and Districts fail to create emission reduction regulation, ARB needs to fulfill its responsibilities in compliance with the intent of AB 617.
- On access to clean mobility, EJ organizations have worked extensively with ARB under the SB 350 study to identify the obstacles that DAC communities facing. **Many of these programs require a more robust commitment on the part of ARB and more dedicated funding.** Creating meaningful incentives, programs and projects that are centered around the needs of DAC communities and responsive to those needs are key in reducing pollution and enhancing access from mobile sources in low income communities of color.
- Also note need for the fossil fuel Phasedown Plan described above, for transportation, Oil Refining, and Oil Extraction.

CUMULATIVE IMPACTS INCLUDING SMALL, AND ALL SOURCES:

- Any serious attempt at reducing emissions in EJ communities must look at the cumulative impacts of a communities under consideration for priority action.
- It is clear that multiple sources of pollution impacting a community cannot be regulated in the same manner as one source impacting the community if each facility creates similar exposure.
- The obvious but unaddressed question EJ advocated have asked for years is why each of multiple sources of pollution in DACs are treated without regard for other sources?
- ARB and Air Districts have so far refused to create regulation from the point of view of impacted and vulnerable community members and they have designed their program from the perspective of industry. The intent of 617 has been to address this great flaw in the regulatory system. We need ARB and Air Districts to stop pointing fingers at each other, and get to work creating a serious cumulative impacts regulatory regime in permitting, rule-making and enforcement.

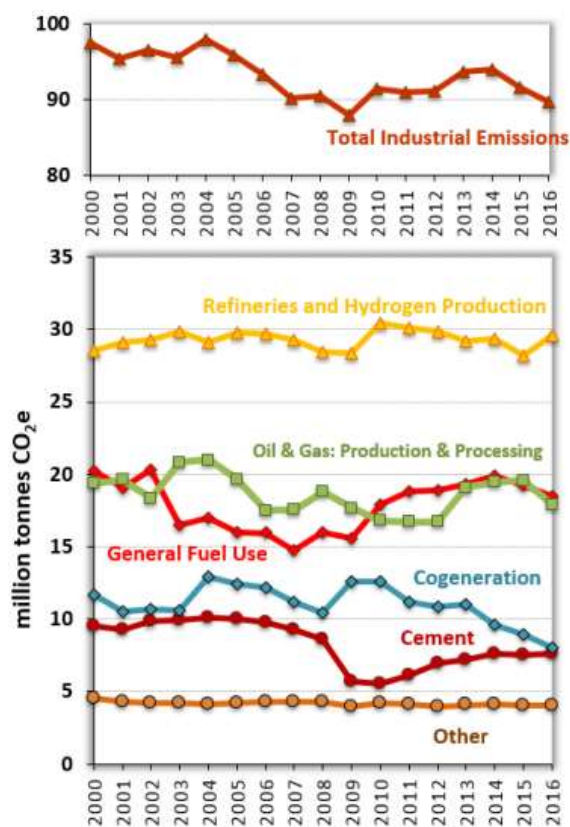
ADD RIGHT TO PETITION CARB TO CORRECT AQMD ERRORS -- a mechanism for public petition for a second-opinion review of emission inventories and permitting errors.

I. Refinery neighborhoods are disproportionately impacted by the largest stationary sources of emissions under Cap & Trade, and available refinery emission cut requirements are missing from the draft Blueprint

Oil Refineries (with their associated hydrogen production and use) are the largest industrial sources under Cap and Trade. Industrial and refinery emissions, which disproportionately impact communities of color, have stagnated or gone up under Cap and Trade since 2009.^{1,2} (See charts at right.) Greenhouse gases are not emitted by themselves, but along with co-pollutant smog-forming and toxic chemicals that severely harm these communities.

We were dismayed the Draft Blueprint included no emission reduction measures for Oil Refineries. AB 617 was purportedly designed to address Cap & Trade gaps, by cutting co-pollutant smog precursors and toxics emitted at the same time as Greenhouse Gases (GHGs) for sources covered by Cap & Trade (of which refineries and their associated hydrogen production and use are the largest stationary sources).

At the Wilmington workshop in June, CARB staff responded to such community comments, and committed to add specific refinery measures to the Blueprint. We look forward to strong state-mandated requirements (not relying on the Air Districts, which have failed our communities).



CARB / Figure 2. Trends in California GHG Emissions. Emissions are organized by the categories in the AB 32 Scoping Plan.

¹ California Greenhouse Gas Emissions for 2000 to 2016 Trends of Emissions and Other Indicators, p. 10, https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf

² Cushing L, Blaustein-Rejto D, Wander M, Pastor M, Sadd J, Zhu A, et al. (2018) Carbon trading, co-pollutants, and environmental equity: Evidence from California's cap-and-trade program (2011–2015). PLoS Med 15(7): e1002604. <https://doi.org/10.1371/journal.pmed.1002604> [Facilities regulated under California's cap-and-trade program are disproportionately located in disadvantaged neighborhoods. Statistical analysis found that co-pollutant emissions from regulated facilities were temporally correlated with GHG emissions, and most regulated facilities (52%) reported higher annual average local (in-state) GHG emissions after the initiation of trading, even though total emissions remained well under the cap established by the program.] [California's cap-and-trade air quality benefits go mostly out of state](https://www.berkeleynews.com/news/2018/07/10/california-cap-and-trade-air-quality-benefits-go-mostly-out-of-state/) -- July 10, 2018, Berkeley News, UC Berkeley, **During the first three years of California's 5-year-old cap-and-trade program, the bulk of the greenhouse gas reductions occurred out of state, which means that state residents did not see the benefits of improved air quality from presumed reductions in harmful co-pollutants.**

In summary, we urge CARB to add to the Blueprint, State Refinery Regulations:

- **Mandate replacement of Refinery Boilers & Heaters, in addition to retrofitting and maintenance measures** (cutting smog precursors, toxics, and greenhouse gases).
- **Mandate that air districts require wet scrubbing or equivalent PM2.5 and SOx emission cuts from Refinery Catalytic Cracking units**, which will result in large reductions in deadly particulate matter disproportionately threatening EJ communities
- **Set requirements prohibiting refinery-level emission increases**
- **Prohibit air districts from granting (in-basin) particulate matter (PM) pollution trading credits** instead of limiting and reducing PM emissions
- **Start a plan for at least 80% phasedown of Oil Refineries by 2050**, consistent with AB 32 requirements for 80% GHG cuts by 2050, and consistent with Clean Air Act health standards. California will not be able to meet overall GHG reductions without a plan to phase down fossil fuel production and use – pollution trading will not achieve the 80% cuts, and it leaves heavy polluting sources in our communities. California will not be able to meet Clean Air Act health standards without a phasedown of fossil fueled transportation.

A. Oil refinery neighborhoods throughout the state face severe pollution and health risks, and should be high-priority in AB617 implementation for emission cuts

California Oil Refineries are not only major smog, toxic, and greenhouse gas sources, they also regularly explode, catch fire, flare, and smoke. These episodic emissions are very poorly quantified, but heavily impact refinery neighbors throughout the state regularly. Below are a small fraction of the examples.



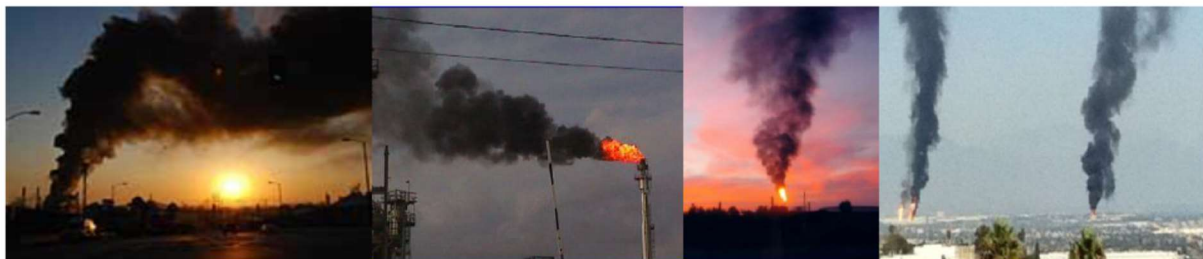
August 2016, Tesoro LA sulfur tank explosion.



2009 Tesoro LA Coker Fire



2012 Chevron Richmond Explosion



Various California refinery smoking flaring events below, and accidents above are small fraction of numbers of hazardous events

Ongoing emissions from California refinery have also been shown to be grossly underestimated. **For example, a recent study of Swedish Scientists with the South Coast Air Quality Management District (SCAQMD) on refineries in greater Los Angeles found they are emitting *on average* 34**

times higher benzene compared to the SCAQMD inventory.³

Wilmington Impacts:

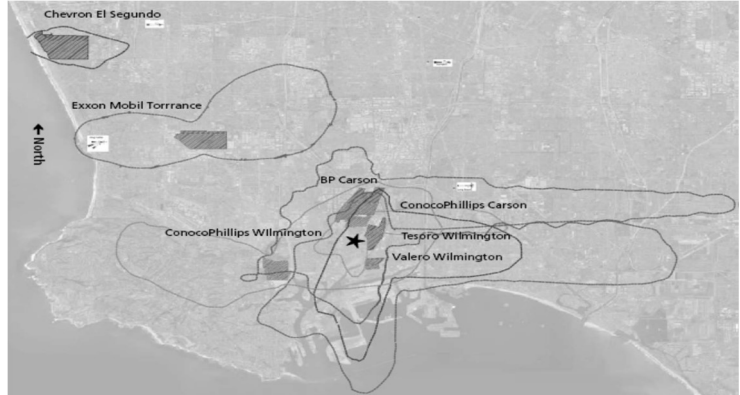
CBE members living here face some of the worst fossil fuel-impacts in the state. This community is over 90% people of color, with many children attending school within a mile of a refinery, and **five oil refineries within, or on, the city's borders. Major diesel trucking and the Ports of LA and Long Beach increase cumulative impacts.**

The massive refinery complex bordered by neighbors in Wilmington, Carson, and W. Long Beach includes Tesoro Wilmington and Carson (recently bought by Marathon, formerly two refineries owned by Tesoro and BP), plus the Phillips 66 Wilmington and Carson refineries, and Valero Wilmington.

Wilmington also contains the largest urban oil field with wells literally next door to houses. Although separate from the Oil Refineries, these are part of the broader Oil Industry impacting Wilmington air quality and adding to methane climate impacts.

Use of dozens of toxic and hazardous chemicals in the hundreds of oil wells in the area went undisclosed for years until the SCAQMD adopted its Rule 1148.2, an important step forward.

See Attachment B, CBE, listing these chemicals and many drilling sites, including the following and dozens of others: Ethylbenzene, Hydrogen Chloride, Hydrogen Fluoride, Methanol, Naphtha, Heavy Aromatics, Toluene, Xylene, Aromatic Amines, Halides, Naphthalene Sulfonate, Formaldehyde Condensate, PAHs, Wood Chemicals, and many more, some listed specifically, others only provided as "Trade Secret" general categories of chemicals.



Wilmington/Carson/W. Long Beach is Ground-Zero to five California refinery air plumes (map from SCAQMD Refinery Pilot Study, 2007) See more in [More in CalEnviroScreen](#).



[After 10 years, neighbors of a Wilmington oil drilling operation still complain of health, environmental issues](#), Bettina Boxall and Joe Mozingo, photo, Rick Loomis / Los Angeles Times, Feb. 20, 2016

³ *Emission Measurements of VOCs, NO2 and SO2 from the Refineries in the South Coast Air Basin Using Solar Occultation Flux and Other Optical Remote Sensing Methods*, Final Report, FluxSense Inc, 11 April 2017, Authors: Johan Mellqvist, Jerker Samuelsson, Oscar Isoz, Samuel Brohede, Pontus Andersson, Marianne Ericsson, John Johansson, available at: <https://www.courthousenews.com/wp-content/uploads/2017/06/FluxSense-Study.pdf>

Richmond and nearby **Rodeo** impacts:

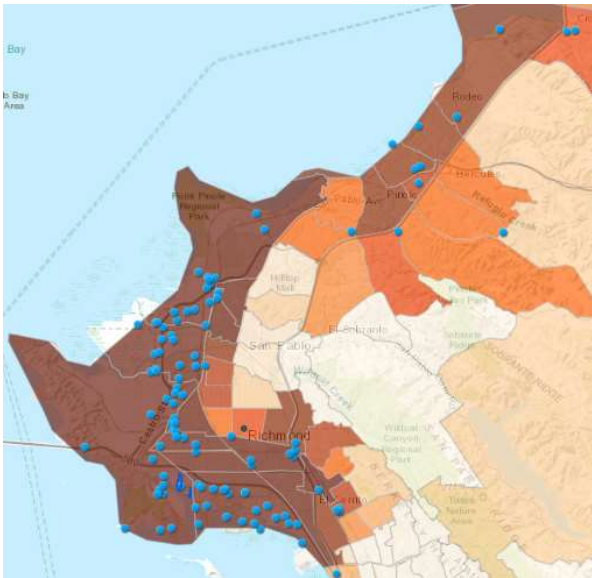
Richmond is home to the 2,900-acre Chevron Richmond Refinery, one of the largest stationary sources of greenhouse gas (GHG) emissions in California, the most egregious polluter in Richmond, and previously the largest refinery in California.

The city of **Rodeo** nearby is home of the Phillips 66 Refinery which has proposed a marine terminal expansion at its Crockett-Rodeo facility. Phillips 66 seeks to more than double its annual tankers traffic from 59 to 129, threatening air and water quality and increasing oil spill risk, significantly affecting low-income people of color.

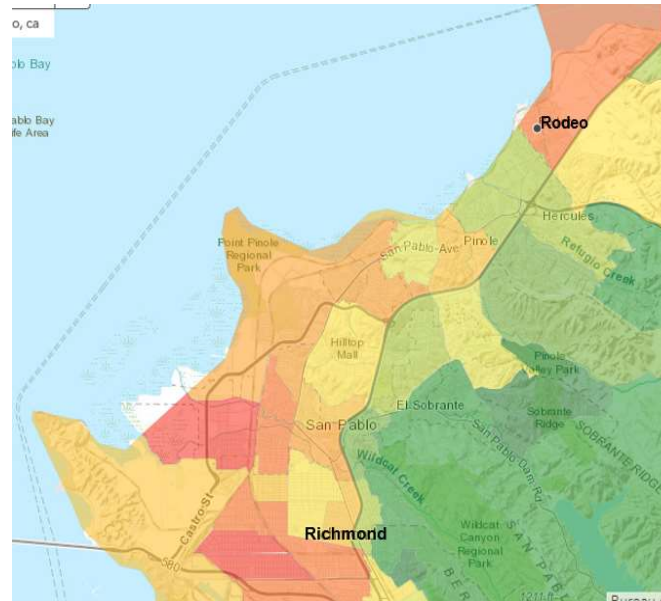
In addition to the major ongoing emissions and repeated explosions and fires at the refineries, CalEnviroScreen shows Richmond and Rodeo both at risk from very high asthma, diesel impacts, hazardous waste, and toxic chemical cleanup sites (Richmond is top 97th, Rodeo top 87th worst, mapped below).⁴



Above: Commuters step out of their cars to take pictures of the fire raging within the Chevron oil refinery on Aug. 6, 2012, found by the US Chemical Safety Board to be the result of repeated failures of Chevron to fix known metal thinning, and due to increases in corrosive sulfur in crude oil (which Chevron had tried to discount during environmental review of an expansion). This explosion narrowly missed killing 19 workers, and sent thousands of residents fleeing the black clouds.



<http://oehha.maps.arcgis.com/apps/webappviewer/index.html?id=9d54eecc28264c2da6495d64ce053913>



Richmond and Rodeo refinery neighbors in Cal EnviroScreen red & orange impact zones, neighboring communities get green zone benefits not enjoyed in Richmond / Rodeo

⁴ <https://oehha.maps.arcgis.com/apps/webappviewer/index.html?id=4560cfbce7c745c299b2d0cbb07044f5>

B. Refinery Boiler and Heater co-pollutant emissions are large, and replacement and retrofit regulations can yield concentrated emission cuts – CARB should begin a state regulation

In 2008, the California Air Resources Board staff⁵ supported our advocacy for direct refinery emission controls. CARB proposed a statewide regulation of Refinery Boiler and Heater control measures in discussion with CBE and other community advocates, to cut both greenhouse gas and co-pollutant emissions in the first state Scoping Plan under AB32. **Unfortunately, a decision was made to sweep all CARB refinery controls into Cap and Trade** (except for a very weak and ineffective version of our proposed industrial energy efficiency measure). **Thus a well-founded state regulation to cut Boiler and Heater emissions disappeared. CARB can now rectify this problem by requiring such a statewide measure under AB617 for these large, polluting, and old refinery units.**

In (2010) CARB published data within the Cap and Trade arena, showing available methods to cut emissions by replacing and retrofitting Oil Refinery Boilers and Heaters (although these methods were never required, but only listed as potential compliance pathways).⁶ CARB analyzed Department of Energy data to identify how much energy would be saved, and quantifying CO2 reductions (due to combustion avoided) for the measures listed below, in million British Thermal Units (MMBTU). CARB provided two spreadsheets calculating emissions reductions, applying the following listed controls. (Note that additional sectors' boilers and heaters were included, such as industrial food, wood product, and chemical industries in CARB's analysis, but by far the larger emissions reductions came from Oil Refineries, which we excerpted below. Oil and gas facilities (presumably referring to extraction) also showed substantial emission reduction opportunities for boilers, and we included those as well.)

Emission reduction measures included (for 282 Refinery Boilers, 293 Oil and Gas Boilers, and 524 Refinery Process Heaters):

1. Replacing low and medium efficiency Boilers (Categories 1 and 2)
2. Optimizing boilers by reducing excess air
3. Retrofitting feedwater economizers
4. Retrofitting with air preheaters
5. Blowdown Reduction with controls and with feedwater cleanup
6. Blowdown heat recovery
7. Optimizing steam quality
8. Optimizing condensate recovery
9. Minimizing vented steam
10. Boiler insulation maintenance
11. Steam trap maintenance
12. Steam leak maintenance
13. Replacing low and medium efficiency heaters

⁵ Dean Simeroth, Criteria Pollutant Branch Chief at that time

⁶ CARB, Cap and Trade 2010 webpage, at: <https://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm> , including CARB's methodologies and assumptions in APPENDIX F COMPLIANCE PATHWAYS: <https://www.arb.ca.gov/regact/2010/capandtrade10/capv3appf.pdf> , and two CARB spreadsheets -- [Compliance Pathways Analysis – Boilers: http://www.arb.ca.gov/cc/capandtrade/capandtrade/compathboiler.xls](http://www.arb.ca.gov/cc/capandtrade/capandtrade/compathboiler.xls) [Compliance Pathways Analysis - Process Heaters: http://www.arb.ca.gov/cc/capandtrade/capandtrade/compathprocessheat.xls](http://www.arb.ca.gov/cc/capandtrade/capandtrade/compathprocessheat.xls)

14. Optimizing heaters
15. Recovering flue gas heat
16. Replacing refractory brick
17. Heater insulation maintenance

CBE also submitted comments about this in 2010, advocating that CARB take advantage of these options through a direct emission reduction regulation for Oil Refineries, in order to address the co-pollutants smog precursors and toxics in refinery communities, as well as cutting greenhouse gases. CARB however decided to continue pollution trading in lieu of direct emission reductions. Since then CARB has acknowledged in many proceedings the need to directly cut co-pollutants in EJ communities, and AB617 proceedings acknowledge and state they will address this need. Consequently, we are resubmitting data which are still relevant, and since no statewide regulation was ever enacted. Hundreds of oil refinery boilers and heaters are in operation statewide, and continue as major polluters, many operating for decades. And in the SCAQMD, the RECLAIM program (now sunseting), has long replaced direct regulation of NOx and SOx with pollution trading. Now is the time to return to direct regulation in EJ communities.

Below we show the reductions in combustion of fuels in the heaters and boilers which CARB calculated for each of the measures identified. CARB used this information not only to identify the fuel use reduction, but also the reductions in Greenhouse Gases (GHGs). CBE submitted calculations in 2010 to show avoided NOx and CO emissions associated with this fuel reduction, using AP 42 emissions factors. Since ten years have passed, it is unknown exactly what controls are in place or not in place for each boiler and heater, and since EPA emission factors vary in accuracy, we are presenting the data in the original CARB form, as *fuel use avoided*.

We now urge CARB to carry out an updated statewide assessment of Refinery and Oil and Gas Boilers and Heaters to characterize each one in a public database, and begin the process for a statewide regulation requiring replacing antiquated heaters and boilers and other emission reductions. **These should not wait until the CARB BACT/BARCT Clearinghouse is developed.** These Measures to avoid burning fuels, result in reductions in GHGs, smog-forming chemicals, and toxics.

TABLE 1: BOILERS-Refinery and Oil & Gas facilities–Fuel Reduction Measures, MMBTUs/year

	1. REPLACE BOILERS		2. OPTIMIZE BOILERS		3. FEEDWATER ECONOMIZ.	
	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2
Refineries	3,339,654	3,258,199	1,500,618	900,371	667,931	400,758
Oil and Gas	3,035,370	2,072,935	954,725	572,835	743,666	446,199
Total	7,334,421	6,293,435	2,921,920	1,753,152	1,701,004	1,020,602
	4. AIR PREHEATER		5. BLOWDOWN PRCTC		6. BLOWDWN HEAT RECOV	
Refineries	166,983	100,190	189,247	567,741	333,965	200,379
Oil and Gas	127,486	76,491	174,230	522,691	212,476	127,486
Total	358,416	215,049	436,122	1,308,367	650,279	390,167

	7. OPT STEAM QUAL		8. OPT CONDENS. REC		9. MINIM. VENTD STEAM	
Refineries	129,133	77,480	178,115	106,869	228,210	136,926
Oil and Gas	160,065	96,039	113,320	67,992	216,017	129,610
Total	289,198	173,519	291,435	174,861	444,227	266,536
	10. INSUL. MAINT.		11. STEAM TRAP MAINT.		12. STEAM LEAK MAINT.	
Refineries	3,117,011	834,914	3,339,654	3,339,654	1,113,218	667,931
Oil and Gas	1,983,108	531,190	2,124,759	2,124,759	708,253	424,952
Total	5,100,119	1,366,103	5,464,413	5,464,413	1,821,471	1,092,883

TABLE 2: HEATERS - Refineries -- Fuel Reduction (MMBTUs/year)

	1. REPLACE HEATERS		2. OPTIMIZE HEATERS		3. RECOV. FLUE GAS HEAT	
	Cat. 1	Cat. 2	Cat. 1	Cat. 2	Cat. 1	Cat. 2
Refineries	8,052,390	5,040,927	2,786,020	1,671,612	1,240,068	744,041
	4. REPL. BRICK		5. INSUL. MAINT.			
Refineries	165,342	99,205	189,247	567,741		

Many of these emission reduction measures are additive, others may not be, but an updated inventory and regulatory process can identify the highest priority and most effective pollution reduction measures.

- **CARB’s data above estimated that replacing both low and medium efficiency Boilers and Heaters alone accounted for more than 26,000,000 MMBTU/year in avoided fuel combustion (26x10¹² BTUs),** which would be concentrated in heavily impacted communities.
- CARB-calculated GHG reductions associated with these two measures alone was 1.3 million metric tons per year.⁷ CBE calculated associated NOx, CO, and other co-pollutant reductions in 2010 using AP42 emission factors associated with this reduction in fuel combustion, which resulted in many tons per day in emissions reductions.⁸ We are not reproducing our original submittal for these pollutants, since almost a decade has passed.
- Instead, we are urging CARB to produce an updated public statewide inventory of Refinery and Oil and Gas Boilers and Heaters as soon as possible, since these are known major polluters. (We ask for fuel type, volumes used, controls, permit, monitoring conditions, age, etc.).
- Although valuable, our communities do not want to wait years for the BARCT/BACT Clearinghouse to be completed, while AQMDs continue to permit refinery and pollution expansions, with hidden emissions.
- Additional reductions from ongoing requirements for insulation and leak maintenance, as well as optimizing combustion requirements could be achieved, and additional pollutants including particulate matter, sulfur oxides, and more, would also be eliminated through these energy-saving measures, but were not calculated.

⁷ *Id.* Compliance Pathways Analysis – Boilers, and Compliance Pathways Analysis – Process Heaters -- CARB spreadsheets

⁸ *CBE Comments on Draft Cap and Trade Regulation: Draft Cap & Trade Regulation Misses California GHG and Pollution Reduction Opportunities, Job Opportunities, and Contains Egregious Errors*, submitted to CARB, Dec. 14, 2010

While we expect that some refinery boiler and heater emissions may have improved, we know for a fact that some have been allowed to *increase*. (See the case of the Tesoro Los Angeles Refinery below.)

Finally beginning the regulatory process originally proposed a decade ago by CARB's own Criteria Pollutant Branch Chief (before the Cap and Trade program undermined such direct refinery emissions cuts) can achieve the following -- updated data, identifying the worst polluting boilers and heaters in the state, requiring replacement, maintenance, and combustion optimizing, setting BACT emission standards and CEMS requirements (Continuous Emission Monitoring Systems) for properly calculating both baselines and emissions, and setting other requirements should be put in place.

Note that we are not proposing that this should be subsumed only into the state's BACT/BARCT clearinghouse for new and modified sources, but instead should be a high priority stand-alone regulation on existing refinery Boilers and Heaters, which are already known major pollution sources with known fixes (especially replacement).

One example AQMD sweetheart deal for a Refinery Coker Heater permitting change (at the Tesoro Los Angeles Refinery), indicates emissions may be grossly underestimated for other Heaters and Boilers:

While grandfathered oil refinery Boilers and Heaters throughout the state need replacement, we have found that Air Districts regularly let them off the hook. An example is the H-100 Coker heater at Wilmington Tesoro (now Marathon). This heater was constructed in 1968⁹ (50 years old). It was allowed an increased firing rate from 252 to 302 million British Thermal Units per hour (MMBTU), a 20% increase in combustion of fuels, without SCAQMD counting any emission increase. Incredibly, the SCAQMD allowed Tesoro to count this increased burning of fuel as an emission *decrease*, despite this being physically impossible. This supposed decrease was based on comparison to a chosen baseline period of extremely high emissions, over a short timeframe, under unusual conditions. No physical improvements were made to this heater.

This supposed emission decrease was justified by a statement that Tesoro believed they could reduce emissions, and by a flimsy permit condition allowing Tesoro to calculate emissions, choosing averaging periods as it wishes.¹⁰ Stated pre-project emissions were 352.47 lbs/day of NOx,¹¹ which if accurate,

⁹ Heater H-100, Tesoro Los Angeles Refinery Title V permit 272th page of pdf,

¹⁰ H-100 daily permit limit. 293rd page of PDF, Title V. [*The operator shall calculate the daily emissions for NOx and SOx using the SCAQMD certified CEMS.*] Tesoro was previously allowed by the SCAQMD to set the very high baseline for this heater during environmental review, based on unusual conditions during the 15 highest emitting days out of a 2-year period (also from CEMS data), making it appear that emissions were not increasing despite being allowed a 20% increase in fuel combustion (from 252 to 302MMBTU/hr). This was contrary to a California Supreme Court decision stating this method is not legal for setting baselines, when the SCAQMD used the same method at the Phillips 66 refinery. SCAQMD ignored this decision and allowed the same method to be used for Tesoro's LARIC project including the H-100 heat rate increase. Then SCAQMD's permit allowed Tesoro to calculate compliance with a supposed daily permit limit of 181 lbs/day, again based on Tesoro's choice of averaging period. This allows Tesoro to choose the most favorable conditions (in this case, the lowest emissions period of its choice). On the other hand, the *hourly* limit for this heater of 18.4 lbs/hour, which allows emissions up to 442 lbs/day, is consistent with the 20% increase in fuel use allowed, and a 20% increase in emissions above the pre-project 352.47 lbs/day. This indicates the real daily emissions limit is 442 lbs/day.

¹¹ Tesoro LARIC (Los Angeles Refinery Integration and Compliance project) FEIR (Table A-3), <http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects>

would increase to 422 lbs/day of NOx (20% higher due to burning 20% more fuel) from this single heater. Instead it was shockingly allowed to show an emission decrease down to 181 lbs/day.

If this heater had been required to meet BACT (Best Available Control Technology), it would have to reduce down to at least 72 lbs/day¹² and perhaps lower, instead of allowing hidden emissions of 422 lbs/day for this single heater.

Because there are so many refinery Boilers and Heaters throughout the state, examples like the Tesoro coker heater deal in addition to CARB's data, show that emissions reduction potentials are large. While the Bay Area and South Coast have regulated refinery boilers and heaters in the past, and the South Coast is planning new regulations to replace its RECLAIM pollution trading program for NOx and SOx, our experience is that these are underregulated major sources of pollution concentrated in communities of color receiving permitting and regulatory decisions highly favorable to the polluters.

ACTIONS:

-- **CARB should immediately require reporting to a new public statewide database all Oil Refinery Boilers and Heaters in the state**, including vintage, emissions controls, fuel type, fuel combustion, location, monitoring, permit conditions, etc.

-- **CARB should begin a regulatory process to replace old refinery boilers and heaters**, require meeting BACT standards, increase maintenance, and require other measures listed in the tables above.

Because these are very large combustion sources located in communities of color, because these sources emit NOx, CO, other criteria pollutants and toxics, because these also emit greenhouse gases while Air District have allowed these to go without replacement for decades, **these sources are excellent candidates for statewide mandated regulation.**

C. Mandate that air districts require wet scrubbing or equivalent PM2.5 and SOx emission cuts from oil refining catalytic cracking units (CCUs)

Nine oil refineries operate catalytic cracking units (CCUs) with a collective capacity of 642,000 barrels/day in Avon, Benicia, Carson, El Segundo, Martinez, Richmond, Torrance and Wilmington, CA.¹³ CCUs are exceptionally high-emitting sources of air pollution that causes environmental injustice and premature deaths unnecessarily because air districts have failed to require proven control technology

¹² For example, a cursory review of coker heater BACT determinations found the *State of WA Refinery Coker Heater BACT Determination at Cherry Point*: Ultra Low NOx Burners with Good Combustion Practice and Selective Catalytic Reduction (ULNBs w/GCPs and SCR) meets 0.01 lb/MMBtu, p. 40, May 23, 2017,

https://fortress.wa.gov/ecy/ezshare/AQ/PSD/PSD_PDFS/BP_Blaine_TSD.pdf

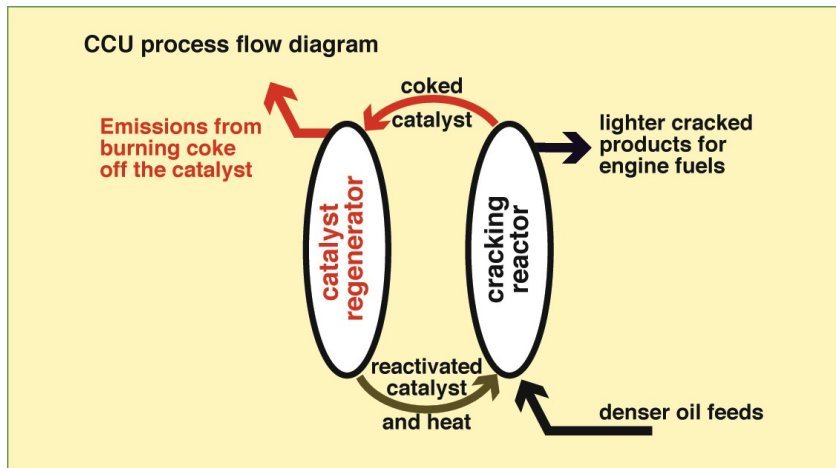
This would result in Tesoro's H-100 Heater at a limit of 72 lbs/day (302 MMBtu/hr x 0.01 lb/MMBTU = 3.02 lb/hr x 24 hrs)

¹³ *OGJ surveys downloads*; PennWell: Tulsa, OK. 2018. 2018 Worldwide Refining Survey, *Oil & Gas Journal*. Web site: <http://www.ogj.com/index/ogj-survey-downloads.html> (accessed February 15, 2018.)

that can cut CCU emissions. We ask CARB to stop this injustice and protect our health by mandating CCU PM_{2.5} and SO_x cuts consistent with this proven wet scrubbing technology now.

Catalytic cracking is an exceptionally polluting refining process.

Catalytic cracking units (CCUs) are exceptionally—and inherently—polluting because burning a form of petroleum coke, the dirtiest-burning fuel used in refineries, is intrinsic to their process design. *See* Diagram.



The CCU process continuously reactivates its process catalyst by burning off coke that forms on the catalyst during the process reaction (diagram right) in a catalyst regenerator vessel (diagram left). Burning the coke supplies most of the heat for the process reaction (diagram bottom). One CCU alone thus burns 650–900 tons of coke daily.¹⁴ Despite the partial capture of the pollution dumped from the regenerator (diagram top left), burning all that coke emits huge amounts of air pollutants.

Without wet scrubbing CCUs can dominate refinery-wide PM_{2.5} emissions. For example, CCUs are the largest source of PM_{2.5} at the Shell Martinez and Chevron Richmond refineries, emitting 127 tons/year (21% of refinery-wide PM_{2.5}) at Shell in 2014 and 274 t/y (58 % of refinery-wide PM_{2.5}) at Chevron from 2010–2014. These examples are from air district inventory data for years when CCU estimates were based on source tests measuring condensable as well as filterable PM.¹⁵ Wet scrubbing has proven able to cut CCU emissions dramatically. It can capture substantial portions of filterable PM_{2.5} and sulfur compounds before they emit. That sulfur can otherwise react with ammonia to form condensable ammonium sulfate PM_{2.5} in the CCU emission stack and plume.

CCU PM and SO_x emissions are deadly and cause environmental *injustice*.

A massive collection of scientific evidence indicates that PM_{2.5} is the deadliest criteria air pollutant in California, as ARB well knows. In the Bay Area, PM_{2.5} exposures account for more than 90% of

¹⁴ Bay Area Air Quality Management District, various dates. *Emissions Inventory abated and unabated emissions, Chevron Richmond refinery*; District data reported by the City of Richmond, CA in EIR SCH #2011062042, Appendix 4.3–EI.

¹⁵ Source-specific BAAQMD Emission Inventory data reviewed by CBE pursuant to the Public Records Act and vetted with District staff during development of proposed “caps” Rule 12-16.

premature deaths associated with air pollution¹⁶ and kill an estimated 2,000–2,500 people each year.¹⁷ Statewide, and especially in the Los Angeles and San Joaquin basins, the impacts are even worse—and the impacts are worse still in low income communities of color near the refineries.

Disparately severe health risk from ‘hot spot’ exposures near this exceptionally high-emitting source is obvious—and has long been documented by clear scientific evidence. Peer reviewed research, in which CBE members participated, documented disparately severe outdoor *and* indoor PM_{2.5} exposures linked to refinery emissions in 2009.¹⁸ In 2010, ARB’s former environmental justice advisors showed that “refineries account for the largest portion (93%) of the state-wide PM₁₀ pollution disparity score, or difference between the emissions burdens of people of color and non-Hispanic whites” among all major GHG emitting facilities under ARB’s cap-and-trade scheme.¹⁹ More recently, a prestigious group of independent health experts estimated in 2017 that communities within 2.5 miles of refineries face a disparately severe PM_{2.5} mortality risk from refinery emissions as much as 8–12 *times* that of the Bay Area population as a whole.²⁰ (See Attachment C)

Wet scrubbing is proven technology that should have been required long ago.

A more effective CCU emission capture technology, wet scrubbing, has been demonstrated in practice. Wet scrubbing has been installed to control PM_{2.5} and SO_x emissions from the CCU at the Valero Benicia refinery and has operated there since 2011.²¹ The scrubber controls its CCU, fluid coker, and crude unit furnace emissions.

Air District Emission Inventory data show that wet scrubbing brought combined CCU, fluid coking and crude furnace PM_{2.5} emissions it controls at Benicia down to an average of 0.72 tons/year during 2011–2014.²² That emission rate (0.72 t/y) is 99% less PM_{2.5} than either the Shell Martinez CCU (at 127 t/y) or the Chevron Richmond CCU (at 274 t/y) emit now.²³ CCU SO_x emissions at the Benicia refinery itself were cut by roughly 99%, from 1,158 t/y in 2010, before the scrubber began operating, to an

¹⁶ *Understanding Particulate Matter*; BAAQMD public report; 2012. *See esp.* page 26.

¹⁷ *See* Fairly and Burch, 2016. *Multi-Pollutant Evaluation Method Technical Document 2016 Update*; documentation for the State Implementation Plan for the Bay Area Air District on 19 April 2017. San Francisco Bay Area Air Quality Management District: San Francisco, CA.

¹⁸ Brody, J. G., Morello-Frosch, R., Zota, A., Brown, P., Pérez, C., and Rudel, R. A. Linking Exposure Assessment Science with Policy Objectives for Environmental Justice and Breast Cancer Advocacy: The Northern California Household Exposure Study. *American Journal of Public Health* **2009**;99:S600–S609. DOI: 10.2105/AJPH.2008.149088.

¹⁹ Pastor, M., Morello-Frosch, R., Sadd, J. and Scoggins, M. S. *Minding the Climate Gap: What’s at Stake if California’s Climate Law isn’t Done Right and Right Away*; **2010**. College of Natural Resources, U.C. Berkeley, Department of Environmental Science, Policy and Management, U.C. Berkeley, and Program for Environmental and Regional Equity, University of Southern California.

²⁰ Kuiper, H., Broome, C. V., Brunner, W., Gould, R. M., Heller, J., Jackson, R. J., Kirsch, J. L., Neutra, R., Newman, T. B., Ostro, B., Rudolph, L., Shonkoff, S. BC., and Sutton, P. *Health impacts and implications should be included in the No Project and alternative scenarios and the environmental and regulatory settings section of the EIR for BAAQMD Rule 12-16*; 8 May 2017 health experts report to BAAQMD including discussion, appendices and references.

²¹ The scrubbing was implemented as proposed to offset impacts of a proposed refinery expansion; *see* Valero’s November 2007 Application for Authority to Construct and Permit to Operate Valero Improvement Project Amendments (BAAQMD Application 016937) at page 2-1.

²² Source-specific BAAQMD Emission Inventory data reviewed by CBE pursuant to the Public Records Act and vetted with District staff during development of proposed “caps” Rule 12-16.

²³ *Id.*

average of 4.6 t/y from 2011–2014.²⁴ Pre-scrubber PM_{2.5} was measured less well than SO_x at the CCU, but the scrubber cut Benicia CCU PM_{2.5} emissions more than 90% based on available data.²⁵ This huge reduction in deadly pollution should have been required at all refiners' CCUs as soon as it was proven at the Benicia refinery CCU.

Instead, failures to require wet scrubbing make things worse. Refiners dump ammonia into less efficient and undersized electrostatic precipitators (ESPs) on their CCUs to meet PM₁₀ limits. That *increases* CCU PM_{2.5} emissions by boosting formation of condensable ammonium sulfate PM_{2.5}. Condensable PM_{2.5} is up to 94–95% of the total PM₁₀ mass emitted from CCUs with ESPs using ammonia injection, such as the Chevron Richmond CCU.²⁶ And ESPs create a hazard wet scrubbing does not: sparking in startup conditions that ignites explosive gases in pollution incidents like the 2015 Torrance ESP explosion. Allowing refiners to avoid replacing ESPs with wet scrubbers risks another explosion.

ARB action is needed. In the years since it was proven at Benicia, no California air district has required wet scrubbing at all the other refinery CCUs in its jurisdiction. One district has stalled a CCU wet scrubbing measure planned in 2014 despite its own board's direction in 2014²⁷ for maximum feasible refinery emission cuts to be made before 2020. A district's senior staff has testified *against* a local government measure to require PM_{2.5} emission reduction at a refinery CCU.²⁸ Now some district staff say AB 617 is another reason why they plan to further delay this proven emission-cutting measure at the biggest source of the worst air pollutant in low-income communities of color like Richmond.

AB617's Draft Blueprint Appendix C (p. C-5) affirms the priority of reducing PM emissions as one of its top objectives:

To address disproportionate localized air quality impacts, community emissions reduction programs will focus on two objectives:

- Reducing exposure caused by local sources to achieve healthful levels of PM_{2.5} within the community.

For all of these reasons CBE asks that CARB include a requirement under AB 617 for air districts to implement wet scrubbing or equivalent reductions in PM_{2.5} and SO_x emissions from oil refinery catalytic cracking units forthwith.

ACTION

- Mandate that air districts require wet scrubbing or equivalent PM_{2.5} and SO_x emission cuts from catalytic cracking units (CCUs) at oil refineries forthwith.

²⁴ Id.

²⁵ Id.

²⁶ BAAQMD Chevron Richmond refinery Source Test Reports 10021 and 11076.

²⁷ BAAQMD Resolution 2014–07, adopted unanimously on 15 October 2014.

²⁸ See Hearing Transcript, Richmond City Council hearing in the matter of Chevron's Appeal of the Conditions of Approval of the Chevron Richmond Refinery Modernization Project, PLN11-089, EIR SCH #2011062042; July 2014.

D. Begin a plan for Oil Refinery phasedown by 2050:

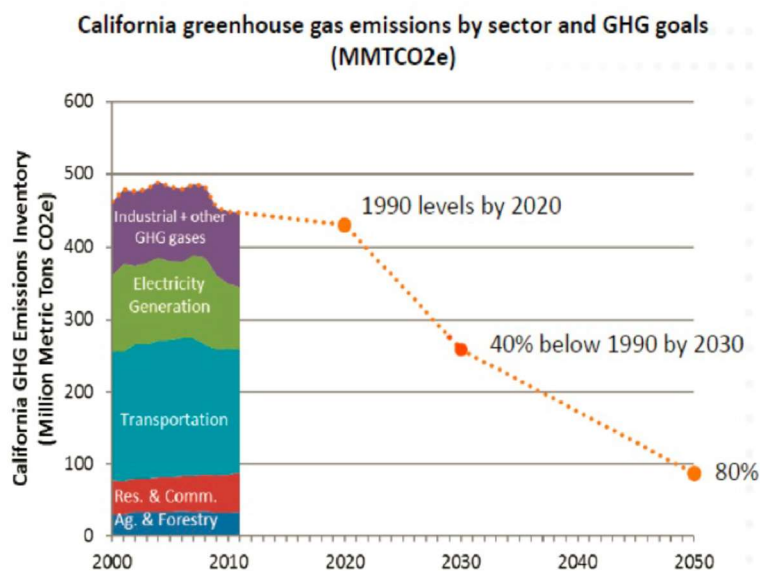
- California cannot meet urgent GHG, Smog, and Toxics goals without a phasedown Plan
- Start with a moratorium on refinery expansions,
- Also ban harmful pollution trading (such as PM2.5) within air basins that replaces emissions cuts and expansion limits

California has set goals which by their nature require replacement of fossil fuels with clean renewable energy, including goals for 80% GHG cuts by 2050, and 40% by 2030. California has made progress on the electricity sector due to substantial changes toward clean renewable electricity (about 30% now, and 50% renewables required on the grid by 2030), but not so in other big sectors. California is also required by the Clean Air Act to meet health-based standards for criteria pollutants as expeditiously as practicable, yet decade after decade, fails to do so. Furthermore, AB617 requirements will not be met for addressing disproportionate pollution impacts in communities of color, unless California begins to replace fossil fueled transportation sources, including vehicles, Oil Refinery production, and oil extraction. None of these local or global air pollution reduction goals will be met without clean energy.

While California has publicized reductions in GHG emissions in its most recent inventory, most of these emissions cuts come from renewable electricity gains, while transportation and refining emissions either made no progress or emissions went *up*, since 2009.²⁹ While little progress has been made replacing fossil-fueled transportation and associated oil refining, and oil extraction, they make up more than half of greenhouse gases and an even larger percentage of smog-precursors. The State has instead deferred to local permitting that allows Business-As-Usual expansions of these fossil fuel sources. While important state programs such as Charge Ahead for vehicle electrification exist, only a bit more than 1% is now electric.

California must make much deeper cuts in emissions from 2020 to 2030 and beyond to 2050, compared to cuts needed to meet much milder 2020 requirements. (CARB's chart at right)

Note that even if the entire electricity generation sector emissions were eliminated, this would still not be enough to meet 2030 goals. Goals cannot be reached without substantial cuts in transportation and transportation fuel production, especially to reach 80% 2050 goals. (Chart from ARB and originally from E3)



²⁹ California Greenhouse Gas Inventory for 2000-2016 — by Category as Defined in the 2008 Scoping Plan, https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf

Rather than *simply starting to plan a long-term phasedown of transportation fossil fuel production at Oil Refineries, regulators rely on mitigation*, pollution trading, and allow new fossil fuel infrastructure that will be in place for decades. *Regulators seem not to be able to imagine requiring phasing down of Oil Refineries.* But California will not be able to meet its long-term goals without doing so.

With communities of color overflowing with asthma and other health harms and most at-risk from impending climate disasters, and with the entire planet at risk, we must at least *begin* a serious plan for oil production and oil refining phase down. AB 617 planning is an appropriate place to include this planning.

We can start by allowing no increase in emissions, and no expansions of fossil fuel production and infrastructure. As highlighted in CEJA's comments³⁰ on the Draft Blueprint, CBE supports the call for:

- **Substantial, quantifiable annual reductions and no net increase in emissions, and that these must be additional to existing requirements**

For starters, CBE urges requirements setting prohibitions on new fossil fuel infrastructure. Other jurisdictions have begun setting such bans on fossil fuel infrastructure. For example, the City of Portland Oregon's ban on expansion of certain fossil fuel terminals was upheld in court earlier this year:³¹

The Oregon Court of Appeals set the stage Thursday for the City of Portland to reinstate its ban on the expansion of bulk fossil fuel terminals. The Court reversed a decision by the state Land Use Board of Appeals, concluding that the city could ban major expansions of bulk fuel terminals without violating the "dormant" commerce clause of the U.S. Constitution.

We also urgently need prohibitions on trading harmful pollutants such as PM2.5 in air basins (as the Bay Area Air District allows), which allows further concentration of such deadly pollutants in communities of color.

Other Oil Infrastructure Needs Regarding Oil Extraction – 2500 ft Buffer Zone: Also please note that our AB617 comments do not include our regional oil extraction goals and concerns, because we are addressing these within the City and County of Los Angeles process at this time. CBE is working to win a 2500 foot buffer zone in the City and County of LA for all existing and new extraction sites, in concert with our STAND LA (Stand Together Against Neighborhood Drilling) coalition. CBE also supports a statewide requirement at least as stringent as this, and supports CEJA, CRPE, and others who are working toward a statewide buffer requirement.

Please also see CBE's 2017 Scoping Plan comments.³²

³⁰ 7/23/2018, CEJA Comments on Draft Community Air Protection Blueprint, p. 5-6 and elsewhere

³¹ For example, this report Jan. 4, 2018,

https://www.oregonlive.com/portland/index.ssf/2018/01/appeals_court_upholds_portland.html

³² 4/10/2017, *CBE Scoping Comments-Just Transition to Zero Carbon and Equity: Ramp up EVs, Stop expanding Power plants, Refineries & Dirty Crudes, Replace Trading with Direct Cuts*

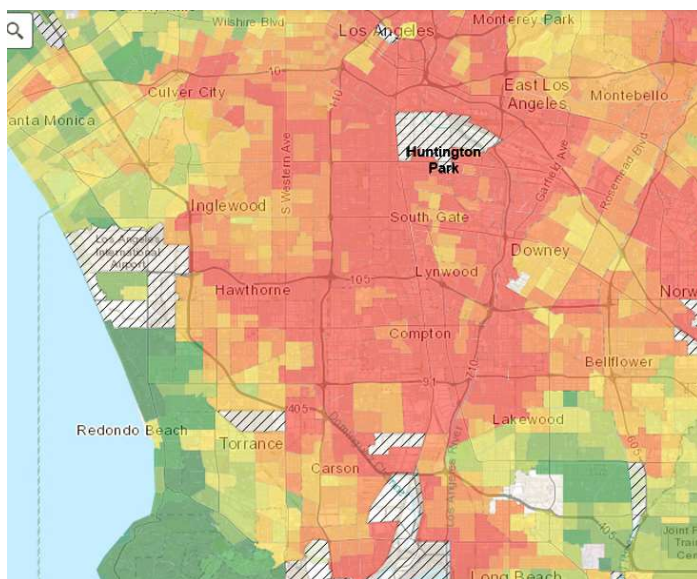
II. Many Areas of the State *without Oil Refineries* such as Southeast LA and East Oakland are severely cumulatively impacted by heavy transportation and smaller stationary sources

CBE also represents heavily impacted community members in Southeast Los Angeles and East Oakland, outside the refinery zones (of Wilmington and Richmond/Rodeo). These areas require customized approaches to clean up transportation and cumulative impacts of local stationary sources, and should be treated as high priority disadvantaged communities pursuant to AB617. Impacts may be somewhat less visible than in refinery towns, but are nevertheless harsh, as shown in CalEnviroScreen scores and other demographic data and evidence.

A. Characterizing South East Los Angeles (SELA) impacts

This area is the heart of LA’s “Red Zone” in CalEnviroScreen (most disadvantaged due to pollution, low income, & other indicators, with heavy impacts unfairly burdening communities of color,). Huntington Park is 97% latino, with a median age of 29, and median income for workers of \$19,000³³.

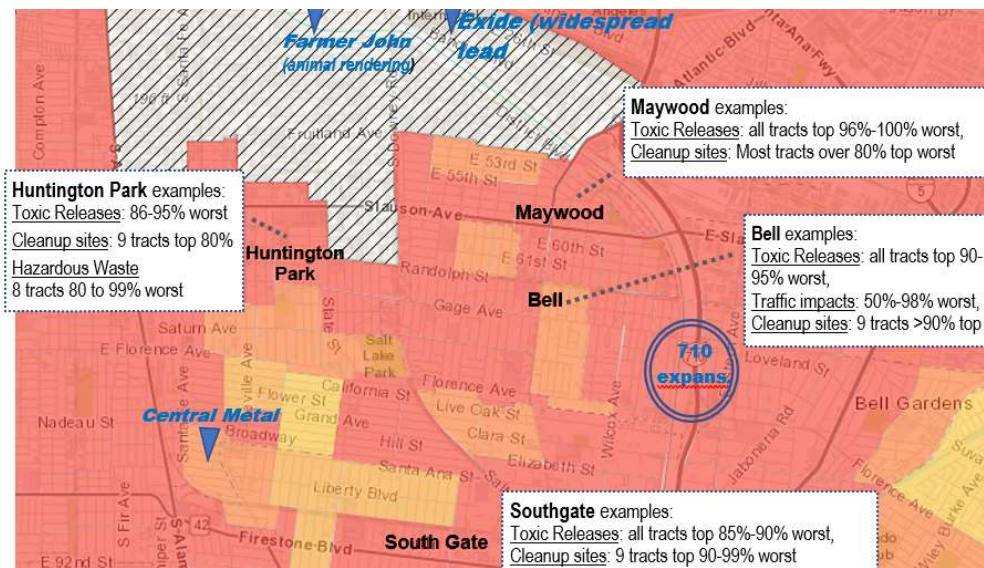
Cumulative Impacts include PM2.5, toxic releases, traffic, diesel, ground-level ozone (smog), cleanup sites, hazardous waste, plus educational, and economic disadvantages, and asthma, cardiovascular, and other health disadvantages. Most census tracts (48 out of 66) for CBE SELA members and partners, including Huntington Park, Maywood, Bell, & Southgate, are in the 91-100% overall most disadvantaged. Total population is 269,281.³⁴ We added markers below relating to four sources of major concern to community members (Exide lead emissions cleanup, which still does not have sufficient funding to clean up all known contaminated residences, Central Metal (closed, but proposing re-opening), Farmer John rendering plant, and the expanding 710 freeway). Also note Alameda Corridor - (transportation impacts).



³³ CalEnviroScreen:

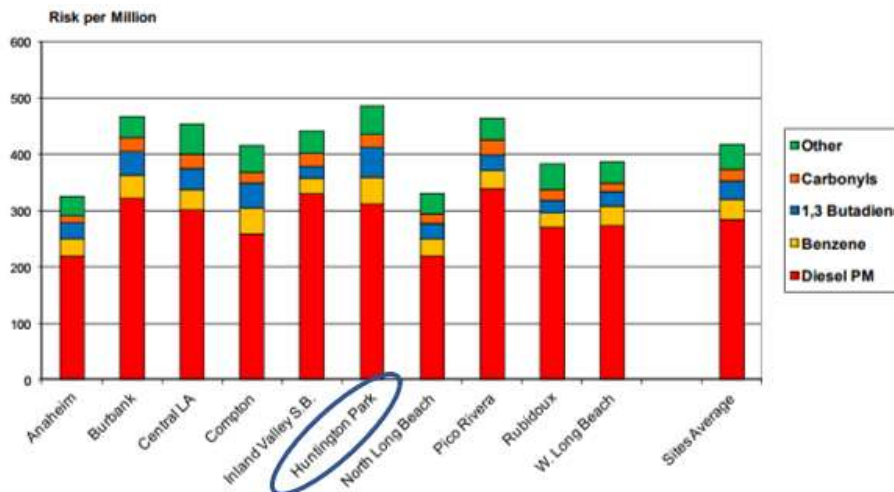
<https://oehha.maps.arcgis.com/apps/webappviewer/index.html?id=4560cfbce7c745c299b2d0cbb07044f5> and Census: [Social Characteristics 2010 Census](#) and [Economic Characteristics 2010 Census](#)

³⁴ [CES3results.xlsx](#)



Additional indicators of health & environmental impacts from various sources:

- The SCAQMD MATES study (Multiple Air Toxics Exposure Study)³⁵ found: “. . . emissions from railroads and goods movement are likely to contribute to the elevated study average UFP [Ultra-Fine Particulate] concentration observed at the Huntington Park site”. The MATES IV Air Toxics Risk chart showed **Huntington Park had the highest risk per million exposed to mobil source air toxics** including diesel PM, benzene, butadiene, and carbonyls.



- **The TRI (US Toxic Release Inventory) 2015³⁶** included **Huntington Park 90255** (362,476 lbs. including chromium, nickel, nitric acid, zinc, and copper from Los Angeles Galvanizing, Aircraft X-Ray Laboratories, Los Angeles Pump & Valves, and West Coast Foundry); **South Gate 90280** (932,653 lbs including PAHs, Chromium, Nickel, Benzene, Cobalt, from Technic-Cast, Tesoro Vinvale Terminal, Brenntag N.A. Inc., Parker Hannifin Corp., and World Oil.); **Bell 90201** (22,811 lbs released, including zinc, nickel, glycol ethers, lithium carbonate, and cyanide compounds, from RPM International, Custom Building Products, and Metal Surfaces.), and **Maywood 90270** (none listed despite having the Exide facility nearby).

³⁵ [MATES IV Final Report](#) Figure 5-2, p. 5-3

³⁶ 2015 TRI data for: [Huntington Park 90255](#), [South Gate 90280](#), [Bell 90201](#), and [Maywood 90270](#)

B. Characterizing East Oakland impacts

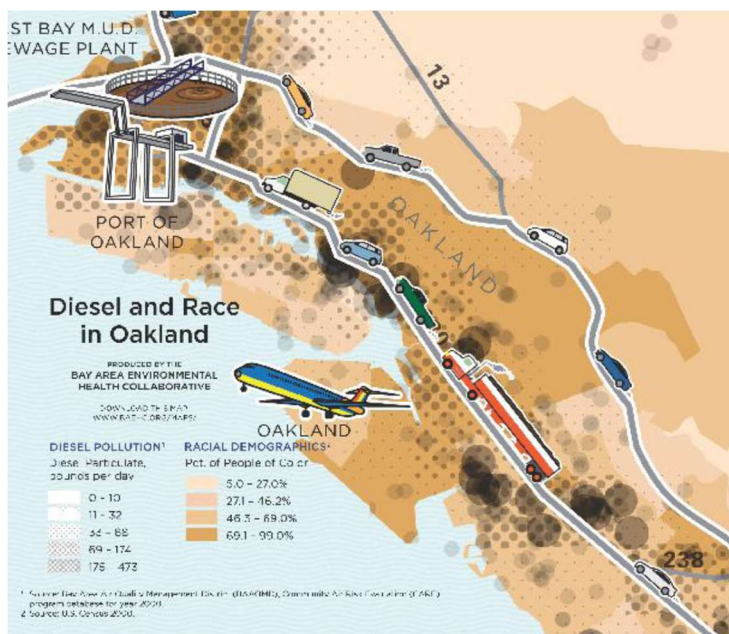
East Oakland's Hegenberger Corridor (roughly 1.5 miles by 0.8 miles) is a largely black and latino community in the heart of the Elmhurst neighborhood, with a history of industrial pollution, with heavy diesel, asthma, hazardous waste, and housing impacts.³⁷

It is home to the Oakland Coliseum, the 100-year-old American Brass & Iron Foundry, and major transportation and freeways serving the Port of Oakland, the Oakland International Airport, and the Bay Area in general.

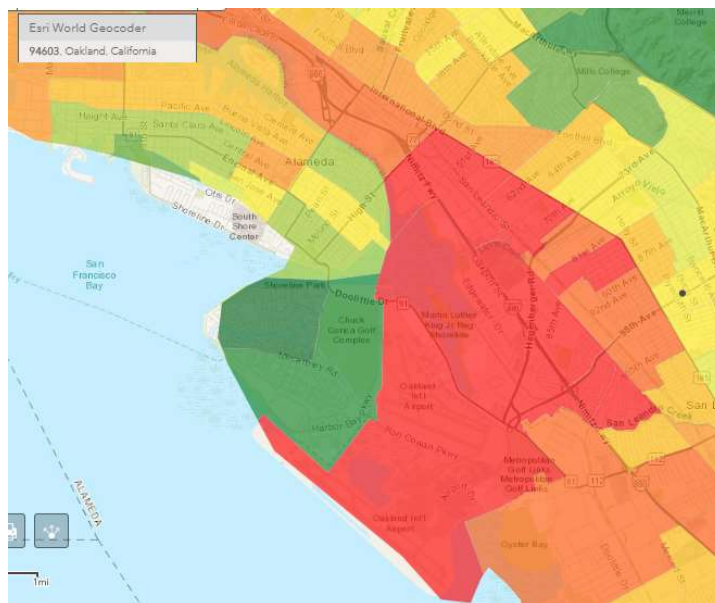
After World War II, the flight of the white middle-class and discriminatory practices by financial institutions contributed to disinvestment in East Oakland. The community is burdened by poor schools, inadequate health care and social services, and employment opportunities largely limited to low-paying stressful jobs.³⁸

CBE's East Oakland Particulate Matter 2.5, Community-based Air Monitoring Research Report found:³⁹

East Oakland has a childhood asthma hospitalization rate 150 to 200% higher than Alameda County as a whole, and life expectancy in East Oakland for the years 2000 to 2003 was 72.0 years, which was 6.9 years lower than Alameda County. Air pollution from busy roadways, which is made up of many compounds and chemicals, including particulate matter, are linked both to increased childhood asthma, impaired lung function, allergies,



East Oakland Diesel Truck Survey Report, CBE, 2010, <http://www.cbecal.org/resources/our-research/#cumulative>



CalEnviroScreen 2018 East Oakland shows 95-100th percentile worst scores for disproportionate impacts, including the 92th highest percentile for Diesel impacts

³⁷ Oakland, CA, 94621 CalEnviroScreen: <https://oehha.ca.gov/calenviroscreen/maps-data>

³⁸ Cumulative Impacts in East Oakland, CBE, 2008, <http://www.cbecal.org/resources/our-research/#cumulative>

³⁹ CBE, Sept. 2010, <http://www.cbecal.org/wp-content/uploads/2013/01/East-Oakland-PM-Monitoring-Report-FINAL-2010.pdf>

heart disease and mortality. East Oakland residents have been shown to be heavily impacted by industrial stationary and mobile sources of air pollution located near homes, schools, recreation centers, and churches.⁴⁰

And in the recent years an industrial-sized crematorium was permitted in already heavily-impacted East Oakland, without sufficient public review and protections. Human cremation is linked to mercury, dioxin, and other harmful emissions. Last year, Air District officials were reported in an East Bay Express article, as pointing to AB617 to solve cumulative impacts from this and other East Oakland sources.⁴¹

C. What does Southeast LA and East Oakland need, to reduce all these impacts?

Like other communities, South East LA, and East Oakland need:

- **Clean and equitable Energy** (access and development of Zero Emission transportation and infrastructure (such as charging), public transit, a solar grid, etc.);
- **Accountability and Funding for toxic site cleanup** (e.g. Exide in SELA)
- **Better permitting, enforcement, no rubber-stamping expansions, and real evaluation of alternatives by regulators** (e.g. Industrial Crematorium in East Oakland, 710 Freeway expansion in SELA)
- **Stop permitting that continues to increase Cumulative Impacts of toxic sources in these communities**
- **Just Transition to a green, equitable economy**

III. Clean Transportation needs are a statewide need in all EJ communities

In addition to large industrial sources, pollution from transportation of people and goods are a major source of pollution in most low-income communities of color. Much more can be said on developing and mandating Zero Emission Transportation measures, which are key to meeting state goals, as described earlier. In summary:

- **ARB must use the mandate of AB 617 for setting aggressive targets in transportation electrification and enhancing clean mobility.** We applaud ARB's work in proposing Innovative Clean Transit.

⁴⁰ Addition details on East Oakland asthma, 94621: Asthma Emergency Department (ED) visits is > twice Alameda County's, & 2nd highest in county. Asthma ED visits is 1,257 per 100,000 residents compared to Alameda County rate of 553/100,000. Asthma ED visit rate for children is 2,350/100,000 (0-4 year-olds) compared to county 1,301/100,000. Asthma inpatient hospitalization rate is 364/100,000 residents (2.5 times the county rate of 147/100,000. The childhood asthma hospitalization rate is 1048 / 100,000 (over twice the county rate of 477 / 100,000). (Source: ACPHD CAPE Unit with 2008-2010 data from California Office of Statewide Health Planning and Development (OSHPD).)

⁴¹ As described in East Bay Express Article, November 15, 2017, <https://www.eastbayexpress.com/oakland/the-return-of-the-crematorium/Content?oid=10841726>

- **ARB needs to replicate similar and technology forcing programs in other transportation categories related to movement of goods.**
- **Additionally ARB needs to issue clear guidance documents for agencies such as Caltrans that undertake expansion of freeways such as I-710.** For years community leaders, public health experts and environmental advocates have asked Caltrans to create a zero emission lane as part of I-710 expansion project, and ARB has the obligation to show how this massive infrastructure project could advance the zero emission programs in California and help California and the South Coast region achieve some of its climate and air quality targets.
- Furthermore ARB needs to provide similar guidance documents for the port of LA, Long Beach and Oakland and Districts fail to create emission reduction regulation, ARB needs to fulfill its responsibilities in compliance with the intent of AB 617.
- On access to clean mobility, EJ organizations including CBE have worked extensively with ARB under the SB 350 study to identify the obstacles that DAC communities facing. **Many of these programs require a more robust commitment on the part of ARB and more dedicated funding.** Creating meaningful incentives, programs and projects that are centered around the needs of DAC communities and responsive to those needs are key in reducing pollution and enhancing access from mobile sources in low income communities of color.

IV. Addressing Cumulatively large impacts from Smaller Stationary Sources in EJ communities

Any serious attempt at reducing emissions in EJ communities must look at the cumulative impacts of a communities under consideration for priority action. It is clear that multiple sources of pollution impacting a community cannot be regulated in the same manner as one source impacting the community if each facility creates similar exposure. The obvious but unaddressed question EJ advocates have asked for years is why each of multiple sources of pollution in DACs are treated without regard for other sources?

ARB and Air Districts have so far refused to create regulation from the point of view of impacted and vulnerable community members, and have designed programs from the perspective of industry. The intent of 617 has been to address this great flaw in the regulatory system. We need ARB and Air Districts to stop pointing fingers at each other, and get to work in creating a serious cumulative impacts regulatory regime in permitting, rule-making and enforcement.

V. Communities need options for recourse through the State, to correct regional agency errors and bias

AB617 requires addressing cumulative impacts, and AB32 requires ARB to design its programs to *prevent* any increase in emissions of toxic air contaminants or criteria pollutants.⁴² It also requires it to consider the overall societal benefits of reducing other air pollutants and benefits to the environment and public health.⁴³ California has not fulfilled these requirements, but does have options to do so.

⁴² H&S Code § 38570(b)(2).

⁴³ H&S Code § 38562(b)(6).

Meantime, communities throughout the state have had to fight their local Air Districts (in the South Coast District, in the Bay Area, in the Central Valley, and more), to receive a fair shake about obvious errors in emissions inventories, permitting, etc. **An important part of fairness in addressing cumulative impacts, is recourse through the state to address bias inside regional agencies such as the Air Districts.**

This problem has been recognized widely. For example, the SCAQMD was found a captive agency of the Oil Industry, as described in the LA Times report below describes the 2016 furor over this agency's favor of oil refiners, recognized by CARB, Senator De Leon, and others:⁴⁴

[How the refineries came to own our air pollution regulators](#)

Refineries account for 60% of nitrogen oxide emissions in the Southland. Above, the Phillips 66 refinery looms over a Wilmington neighborhood. . . . "Regulatory capture" is the term for what happens when an agency overseeing an industry begins to see things the industry's way. Consider the most recent illustration: the South Coast Air Quality Management District board and the refinery industry.

The refineries are among the worst-polluting facilities in the Southland, which has the dirtiest air in the United States. But that didn't stop the board from rejecting on Dec. 4 a clean-air plan worked out by its staff over 37 months and substituting a plan made public that very morning, developed by the Western States Petroleum Assn., a refinery lobbying group.

Given a chance to reconsider its action at a meeting earlier this month, the board voted to stand pat. At the same meeting it fired its executive officer, Barry Wallerstein, who had supported the staff proposal.

These actions have landed the AQMD board in a world of hurt. The board, which is composed of 13 local politicians and business leaders representing Los Angeles, Orange, San Bernardino and Riverside counties, has been upbraided by the California Air Resources Board's executive officer, Richard Corey. He says the clean-air program would be so lax it might well violate state and federal regulations.

State Senate President Pro Tem Kevin de León (D-Los Angeles) has launched an effort to remake the board so its pollution-tolerant majority can be outvoted. On Wednesday, the Sierra Club and three other environmental organizations sued in state court to force the board to reverse its vote. . . . (Full article is attached)

ACTION: We urge CARB to set up a process whereby communities can petition CARB to weigh in and correct errors and bias in permitting, regulation, etc. (For example, see earlier, with the Tesoro H-100 coker heater example.)

⁴⁴ 3/11/16, full article attached as Attachment A

Much more could be said about the breadth and depth of toxic sources impacting our communities, but we urge CARB to begin with the recommendations herein. Thank you for your consideration.

Sincerely;

Julia May, Senior Scientist, CBE, Southern California
(Communities for a Better Environment)

Greg Karras, Senior Scientist, CBE, Northern California

Bahram Fazeli, Research and Policy Director, CBE

-- Attachments A, B included below, Attachment C as separate attachment

ATTACHMENT A

[How the refineries came to own our air pollution regulators](#), by Michael Hiltzik, 3/11/16



Refineries account for 60% of nitrogen oxide emissions in the Southland. Above, the Phillips 66 refinery looms over a Wilmington neighborhood. (Rick Loomis / Los Angeles Times)

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State Senate President Pro Tem Kevin de León (D-Los Angeles) has launched an effort to remake the board so its pollution-tolerant majority can be outvoted. On Wednesday, the Sierra Club and three other environmental organizations sued in state court to force the board to reverse its vote.

In response, the board majority and its industry overlords have offered some of the most fatuous defenses heard from a public body in years.

Board member Mike Antonovich, a Los Angeles County supervisor, informed me in an emailed statement that the AQMD board "is not simply a rubber stamp for District staff." That's true, but it doesn't explain why it should be a rubber stamp for the refinery industry.

Orange County Supervisor Shawn Nelson, who sponsored the initial Dec. 4 motion to accept the industry proposal, argued that the plan does reduce emissions, just not as much as the staff proposal. He observed that the AQMD has no control over cars and trucks, the major source of air pollution. "If we put every company we regulate out of business tomorrow, we still wouldn't meet the clean air mandate," he said. That's hardly an excuse for falling short on the sources it does regulate, which are stationary facilities.

As for the refinery group, its president, Catherine Reheis-Boyd, claimed in an email that the plan adopted by the board amounted to "90% of what was proposed by staff" and that the rejected proposal would have cost the industry more than \$1 billion. Both figures are exaggerations, and even on the surface not especially relevant to the task of reducing emissions to levels that save lives and reduce the cost of dirty air to society.

Nor are those costs evenly distributed. Wilmington and West Long Beach, which are bordered by refineries and the ports of Los Angeles and Long Beach, have some of the highest rates of childhood asthma in the region or state. Some 15% of Long Beach children suffer from the condition, compared with 8% in the county overall. Nitrogen oxides, an asthma trigger, is among the pollutants at issue in the clean air plan.

Refineries, which account for 60% of nitrogen oxide emissions in the Southland, have managed to game air-quality standards.

The debate at the AQMD concerns the RECLAIM program (for "Regional Clean Air Incentive Market,"), a cap-and-trade system the AQMD created in 1993. Instead of directly ordering every pollution-emitter to install clean-air equipment,

RECLAIM established a market in pollution credits; a power plant, cement plant or refinery that met or exceeded its clean-air goals could defray its costs by selling its excess pollution allowances to facilities that hadn't met their goal, and could use the purchased credits to buy time. RECLAIM wasn't supposed to give polluters a break on meeting clean-air standards, just more flexibility in how they did so.

Things haven't worked out that way. "What we've seen over time is that RECLAIM has deep, deep flaws," says Evan Gillespie of the Sierra Club. The biggest flaw is that the market is flooded with excess credits. They're so cheap that it's much more economical for a polluter to buy credits than to install clean-air equipment. That has slowed the pace of environmental improvement.

The refineries are the principal offenders. Electrical generating plants, which also were big players in RECLAIM, have largely been forced by their own regulators to install the necessary equipment. California Portland Cement's Colton plant, which had been the largest single source of nitrogen oxides, shut down in 2013. That could have had a big impact on the air, but its pollution credits remained in the market, allowing other polluters to use them to avoid cutting their own emissions.

The AQMD staff calculated in 2005 that refineries would have to install 51 catalytic reduction units by 2011 to meet clean-air standards. Thanks to RECLAIM, however, only four were installed — and those as a result of orders from the federal Environmental Protection Agency. Avoiding the other 47 installations saved the refinery industry \$205 million, the AQMD staff estimated.

Under RECLAIM, industries were expected to reduce their nitrogen oxide emissions by 7.7 tons per day in 2007-11. By 2012, the reduction had come to only 4 tons — mostly because of industry shutdowns, "not measures taken to reduce actual emissions," the staff reported.

To bring the available credits more in line with emissions, the AQMD staff proposed at the December meeting to "shave" the total credits by 14 tons per day through 2022. The hope is that the price of credits would rise, making them more expensive than installing clean-air equipment.

The staff also recommended front-loading the shave, starting with 4 tons per day this year, followed by 2 tons more each year from 2018 through 2022. The staff chose this schedule because the 2016 reduction could be achieved simply by cutting excess credits out of the market. No installation of equipment would be needed — another pro-industry step. Most important, the staff proposed that credits attached to shutdown facilities be extinguished.

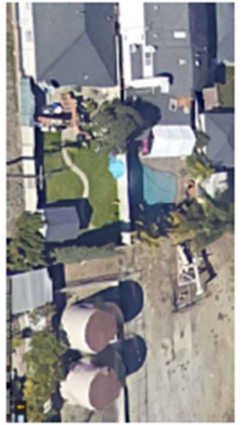
But the refinery group wouldn't have it. The Western States Petroleum Assn. proposed instead a shave of only 12 tons per day, back-loaded so that the most substantial reductions wouldn't kick in until after 2020. The industry also persuaded the AQMD board to refer the elimination of credits from closed facilities to a "working group," which as everyone knows is where such proposals go to die.

Let's be clear: Only one plan is based on analysis of the past and the potential to meet future clean-air mandates. The other plan achieves nothing but relief for the industry, at the expense of everyone in the Los Angeles Basin.

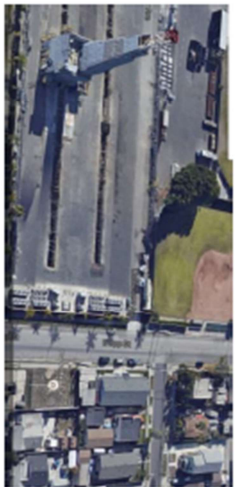
Supervisor Nelson says the board's decision has been misrepresented as a sop to the refineries. "This narrative that we're giving 'olly-olly-oxen-free' to polluters is just fiction," he told me.

But the proof is in the results. RECLAIM has failed, and the AQMD should be replaced with a body that serves the public interest, not just one industry's interest.

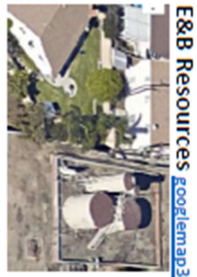
ATTACHMENT B



Oil Drilling near You!



Warren E&P [Googlemap2](#)



E&B Resources [Googlemap3](#)



E&B Resources [Googlemap4](#)



E&B Resources [Googlemap5](#)



Tidelands Oil [Googlemap6](#)

Wilmington neighborhoods are at risk from toxic Oil Drilling in residential neighborhoods!

- CBE is part of the STAND LA coalition (Stand Together Against Neighborhood Drilling). We have been fighting for protections for communities burdened by oil extraction & production, right next to homes. Wilmington is just one impacted community in the region.
- Last year we won stronger notification measures for oil drilling, maintenance, acidizing, and other operations that are happening throughout the LA region.
- For example, the South Coast Air Quality Management District (AQMD) strengthened regulations 1148.1 and 1148.2 to add standards, and increase public notification.
- These rules are still very weak, and pollution controls, monitoring, etc, are primitive compared to other industries.
- We summarized data reported for Wilmington CA. See the back for dozens of toxic chemicals used at these sites, right next to houses (or waterways), including cancer-causing or extremely hazardous chemicals such as Hydrogen Fluoride, and an astonishingly long list of many others.

What Can You Do? ▶ If you experience bad odors or oil eruptions from these operators, report them to the AQMD at 1-800-288-7664 (1-800-CUT-SMOG), which may send an inspector if there are multiple complaints. Some facilities operate better than others, but we believe no site should be near to houses.

▶ You can sign up for notices of "events" at these sites such as drilling, rework, maintenance, well acidizing, etc., or search for information about a site near you, through the SCAQMD, at <http://www.aqmd.gov/home/regulations/compliance/1148-2> ▶ Contact CBE for more info: Julia May, Senior Scientist (julia@cbeal.org), or Alicia Rivera, Wilmington Community Organizer (alicia@cbeal.org)

Communities for a Better Environment - 6325 Pacific Blvd, Suite 300 • Huntington Park, CA 90255 • (323) 826-9771
 Wilmington Office: • (310) 952 9097
 July 2016



Drilling uses many hazardous chemicals including those below: We only found out these were used in Wilmington because of new regulations requiring public reporting. Previously, companies did not even have to report. We still don't know how much is emitted to the air, but many chemicals are volatile. This toxic chemical use should be eliminated. We also oppose contaminating underground areas with toxics, and transporting toxics through neighborhoods.

Warren E&P: 44 Events, 6/8/13-4/22/16, (Most pre 9/15), Well Drilling, Completion, & Rework: Maintenance Acidizing for some events, Gravel Packing some events, Chemicals Reported: 2-Hydroxy-1,2,3-Propanetricarboxylic Acid, 2-Propyn-1-ol, Ethylbenzene, Ethyl Octynol, Glycolic Acid, Hydrogen Chloride, Hydroxyacetic Acid, Isoquinoline, Methanol, Phosphoric Acid, Quinaldine, Solvent Naphtha (Petroleum) – Heavy Aromatic, Terpene Hydrocarbon, Toluene, Xylene. **“Trade Secrets” Chemicals Family Name:** Aldehyde, Aliphatic Alcohol, Aliphatic Compound (1), (2), (3), Alkyl Benzenesulfonic Acid, Alkylaryl Sulfonates, Alkylme Alcohol, Aromatic Amine - TOFA Salt, Aromatic Amines, Aromatic Compound, Aromatic Compound (1), (2), (3), (4), (5), and (6), Non-hazardous ingredients, Ester, Fatty Acid, Fatty Acid Esters, Halides, Inorganic Compound, Inorganic Potassium Compound / Alkali Hydroxide, Inorganic Salt of an Acid, Ionic Compound, Ionic Surfactants, Lubricant, Mixture, Modified Sulfonate, Modified Thiourea Polymer, Naphthalene Sulfonate-Formaldehyde Condensate, Nonylphenol Ethoxylate, Olefin, Organosulfur Compound (1), (2), Oxyalkylated Alkylphenol, Oxyalkylated Polyamine, Phosphonate Salt, Polyacrylate, Polycyclic Aromatic Hydrocarbon, Polycyclic Compound, Polyester, Polyoxyalkylenes, Polysaccharide, Powervis, Proprietary Blend, Quaternary Ammonium Compound (1), (2), (3), Salt Compound, Salt of Organic Acid, Sulfur Compound, Thrurol, Vegetable and Polymer Fibers, Viscosifier, Wood Chemicals

Tidelands: 34 Events, 9/9/13-5/26/16, (Most pre 9/15), Well Drilling, Completion, Maintenance, & Rework: Acidizing & Maintenance Acidizing for some events, Gravel Packing some events **Chemicals Reported:** 1,2,4-Trimethylbenzene, Acetic Acid Ethyl Ester-Polymer with Ethanol, Acetone, Acrylic Polymer, Alkylbenzene Mixture, Aluminum, Aluminum Oxide, Ammonium Chloride, Amorphous Silica, Amorphous Silica Fume, Anionic Acrylamide Copolymer, Aromatic Barite, Barium Sulfate, Bentonite, Calcium Bromide, Calcium Carbonate, Calcium Chloride, Calcium Oxide, Carbon, Carboxy methylcellulose Sodium Salt, Cellulose, Cellulose, Citric Acid, Citrus Terpenes, Crystalline Silica, Cumene, Cyclohexanamine-Sulfate (1:1), Diisopropylphthalene, Disodium Metasilicate, Erythorbic Acid, Ethylbenzene, Ethylene Glycol Monobutyl Ether, Ethyl Octynol, Ferrous Sulfate, Formaldehyde, Glutaral, Glyoxal, Gypsum, Heavy Aromatic Naphtha, Hydrochloric Acid, Hydrogen Fluoride, Isoquinoline, Light Aromatic Naphtha, Magnesium, Magnesium Oxide, Methanol, Methyl Amyl Alcohol, Methyl Ester of Sulfonated Tannin, Mica, Mineral Fiber, Naphthalene, Nitriortriacetic Acid, Oxyalkylated Amine Quat, Oxyalkylated Alkylphenol Resin, Petroleum Naphtha, Petroleum Resins, Polyether, Portland Cement, Potassium Chloride, Propargyl Alcohol, Proprietary, Quinoline, Quinaldine, Saponite, Silica, Silica Crystalline Quartz, Sodium Bicarbonate, Sodium Carbonate, Sodium Chloride, Sodium Gluconate, Sodium Lignosulfate, Stearic Acid, Sulfonate, Synthetic Red Iron Oxide, Terpene Hydrocarbon, Thiourea Polymer, Toluene, Welan Gum, Wood Dust-Soft Wood, Xanthan Gum, Xylene. **“Trade Secrets” Chemicals Family Name:** Acetic Acid, Aliphatic Alcohol, Alkylaryl Amine Sulfonate, Alkylaryl Sulfonates, Amide Surfactant Phosphate Acid Salt, Amide Surfactant Phosphate Ester Salt, Amide Surfactant, Aromatic Amine TOFA Salt, Aromatic Amines, Aromatic Compound, Aromatic Hydrocarbons, Aromatic Petroleum Distillates, Cinnamic Inhibitor, Copolymer, Crosslinked Polyol Ester, Detergent, D-Limonene, Diol Compound, Ester, Fatty Acids, Fatty Acids Ester, Halides-Inorganic Salt, Inorganic Compound, Inorganic Potassium Compound/Alkali Hydroxide, Inorganic Solvent, Ionic Surfactants, Ketone, Linear Alkylbenzene, Lubricant, Mixture, Modified Starch, Modified Sulfonate, Modified Thiourea Polymer, Naphthalenesulfonate-Formaldehyde Condensate – Sodium Salt, Non-hazardous ingredients, Nonylphenol Ethoxylate, Olefin, Organophosphonic Acid Salt, Oxyalkylated Alkylphenol, Oxyalkylated Alkylphenol Resin, Oxyalkylated Amin Quat, Petroleum Resins, Polycyclic Compound, Polyglycol Ester, Polyoxalkylenes, Polysaccharide, Salt Compound, Salt of Inorganic Acid, Salt of Organic Acid, Sulfur Compound, Unsaturated Alcohol, Viscosifier, Wood Chemicals

E&B Natural Resources, 4 Events, 5/21/14 – 7/28/15, Well Rework: Maintenance Acidizing for some events, Gravel Packing some events **Chemicals Reported:** 2-Butoxy Ethanol, 2-Hydroxy-1,2,3-Propanetricarboxylic Acid, 2-Propyn-1-ol, Alumina, Ammonium Chloride ((NH₄)Cl), Calcium Oxide, (CAO), Citric Acid, Ethylbenzene, Ethyl Octynol, Hydrochloric Acid, Hydrogen Fluoride (Hydrofluoric Acid), Iron Oxide (FE2O₃), Isoquinoline, Methanol, Pine Oil, Potassium Chloride, Potassium Oxide, Propyn-1-ol, Quartz (SiO₂), Quinaldine, Sodium Chloride, Solvent Naphtha (Petroleum) - Heavy Arom., Terpene Hydrocarbon, Toluene, Xylene **“Trade Secrets” Chemicals Family Name:** Amide Surfactant Phosphate Acid Salt, Amide Surfactant Phosphate Ester Salt, Amide Surfactant, Aromatic Amine TOFA Salt, Aromatic Amines, Ionic Surfactants, Nonylphenol Ethoxylate.

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July 2016



Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco CA 94105

VIA EMAIL

vdouglas@baaqmd.gov
Victor Douglas

May 8, 2017

Re: Health impacts and implications should be included in the No Project and alternative scenarios and the environmental and regulatory settings sections of the EIR for BAAQMD Rule 12-16

We are writing to encourage the Air District to include a comprehensive health and safety assessment in the final EIR of Rule 12-16, as detailed in the following submission. In particular, by providing a preliminary assessment of potential mortality impacts in the absence of Rule 12-16's preventive measures, this submission demonstrates the feasibility and importance of including a health assessment in the EIR. It is important that such an assessment account for:

- the preventive nature of Rule 12-16
- the influx of heavier crude oil feedstock that is projected in the absence of emissions caps
- resulting exposures and impacts on vulnerable populations, including people who live in proximity to the refineries, have low socio economic standing and / or disadvantaged racial identity, are infants, young children or the elderly, live in already polluted settings, and/or have underlying health conditions

Respectfully

Signatures, listed alphabetically on the following page,

Claire V Broome MD	Adjunct Professor, Rollins School of Public Health Emory University Assistant Surgeon General, US Public Health Service (retired)
Wendel Brunner MD, PhD, MPH	Former Director of Public Health, Contra Costa Health Services
Robert M. Gould, MD	President, Physicians for Social Responsibility, San Francisco Bay Area Chapter Associate Adjunct Professor, Program on Reproductive Health and the Environment, Dept. of Obstetrics, Gynecology & Reproductive Sciences UCSF School of Medicine (for identification purposes only)
Jonathan Heller PhD	Co-Director and Co-Founder, Human Impact Partners Oakland CA
Richard J Jackson MD MPH	Former California State Public Health Officer Director, CDC National Center for Environmental Health (retired)
Janice L Kirsch MD MPH	Medical oncologist and hematologist
Raymond Neutra MD DrPH	Chief Division of Environmental and Occupational Disease Control, California Department of Public Health (retired)
Thomas B Newman MD MPH	Professor Emeritus of Epidemiology & Biostatistics and Pediatrics, University of California, San Francisco (for identification purposes only)
Bart Ostro PHD	Former Chief of Air Pollution Epidemiology Section, California EPA, currently Research Faculty, Air Quality Research Center, UC Davis
Linda Rudolph MD MPH	Director, Center for Climate Change and Health, Public Health Institute Oakland, CA
Seth BC Shonkoff PhD, MPH	Executive Director PSE Healthy Energy Visiting Scholar Dept. Environmental Science, Policy, & Management, UCB Affiliate Energy Technologies Area, Lawrence Berkeley National Lab
Patrice Sutton, MPH	Research Scientist, Program on Reproductive Health and the Environment, University of California, San Francisco (for identification purposes only)
Coordinated by	
Heather Kuiper DrPH MPH	Public Health Consultant, Oakland CA

May 8, 2012

To the Bay Area Air Quality Management District Board:

This submission alerts the Air District that the Rule 12-16 draft EIR does not adequately analyze or discuss the health impacts that were identified in a letter submitted December 2, 2016 during the Notice of Preparation and Initial Study for the Rule 12-16 DEIR. In particular, the draft EIR does not adequately recognize the preventive nature of Rule 12-16, thus omitting health implications from the “No Project” alternative.

Preventing increases in harmful exposures is a well-established health protection measure. (Curie 2011, Pope 2009, Goodman 2002, Hedley 2002, Dominici 2006). A preventive approach to air quality is important, due to an otherwise anticipated increase in Bay Area refineries’ use of heavier, dirtier oil feedstock,¹ (BAAQMD 2012a) which will lead to higher exposures to fine particulate matter (PM2.5). PM2.5 is definitively established as a cause of adverse health impacts, including mortality. Given the dense population of the Bay Area, increased PM2.5 will have large population impacts, presenting a major public health threat. Rule 12-16 is an important public health tool as it caps refinery emissions at current levels, thereby preventing increases in exposure to PM2.5.

Omission of the No Project Alternative (not implementing Rule 12-16) and its health impact

Because Rule 12-16 is a preventive measure, the Air District can anticipate that the “No Project” scenario will increase mortality in the Bay Area population, especially among the disadvantaged. The assessment,² detailed in Appendix A, measures the impact of long-term exposure to increased PM2.5 resulting from transitions to heavier oil feedstock. Adjusting for other exposures, it finds that:

- **Rule 12-16 could cumulatively prevent 800 to 3000 deaths of Bay Area residents given a refinery facility lifetime of 40 years following conversion to heavier crude**
- **The additional mortality burden for the Bay Area’s disadvantaged residents could be 8 – 12 times that of the Bay Area’s general population**
- **Annual monetary valuation of these deaths alone could reach up to \$123.2 million, or cumulatively, up to \$4.84 billion dollars. (CAP, 2017 p C/7)**

This assessment is conservative in its parameters and many of the model parameters are drawn from BAAQMD’s own work. For example, it does not consider indoor air exposures, which may be higher, (Brody, 2009), impacts of ultrafine particulates (Ostro, 2015), or increased combustion, production, and handling of pet coke (US EPA). The submitted analysis is also conservative in scope: It does not include PM2.5-related morbidity, neurological, cognitive, and developmental impairment, (especially of children), hospitalizations, lost productivity, reduced activity, and health-related socio-economic impacts. Significantly, the analysis does not include health impacts associated with flares and other acute PM2.5 exposures, including mortality, cardiac events, hospitalizations, and increased susceptibility to adverse health conditions from the underlying stressors of living in proximity to pollution sources (DeFur 2007, Cutchin 2008, Luginaah 202). It also does not include the significant local climate-related

¹ This assessment is predicated on a finding that, without 12-16, Bay Area refineries will likely undergo large-scale capital conversions for refining heavier crude oils and natural bitumen (including and especially tar sands crude), resulting in increased PM2.5 emissions and toxicity, and increased greenhouse gas emissions. (BAAQMD 2012a, Karras, 2016)

² This assessment draws from calculations of emissions increases attributable to heavier crude oil feedstock produced by Greg Karras of Communities for a Better Environment (Karras, 2016) It was conducted in collaboration with CBE.

health hazards and impacts that will be attributable to the Bay Area's increased refining of heavier crude feedstock.

Even so, this analysis demonstrates that is reasonable and feasible for the District to develop and consider health impact projections in its final EIR. The signatories request that the Air District include the attached assessment (Appendix A) in its final EIR and also supplement it with estimates of additional health impacts attributable to increased PM2.5 and greenhouse gas emissions, especially for vulnerable populations. See also Appendices B, and C for information that can support such additional analysis.

Modify the draft EIR's assessment of alternatives

Emission intensity caps (Rule 13-1) and mass emission caps (Rule 12-16) are complementary measures and their combination could protect health better than Rule 12-16 alone. This alternative is not considered in the draft EIR although Rule 13-1 is discussed in combination with Rule 11-18. CEQA requires an alternative to accomplish the main objectives of the project at hand, yet Rules 13-1 and 11-18 do not provide health protection equivalent to 12-16. Rule 11-18 targets various toxic air contaminants but not greenhouse gases and particulate matter and is fundamentally different in terms of health protection strategy and outcome. Rule 13-1, *as currently drafted*, omits direct control of PM2.5 and could allow facility-wide refinery emissions to increase; it does not provide protections comparable to Rule 12-16. Regardless, it is premature to consider Rule 13-1 in the Rule 12-16 EIR.

Expand the existing environmental and regulatory settings assessments

The following considerations should be included in the environmental settings assessment:

- Cities in the San Francisco Bay Area are among the most polluted in the U.S. (ALA, 2017) High baseline air pollution augments susceptibility to adverse health threats. Due to this baseline condition, Bay Area residents will likely experience augmented health risk and burden from increased emissions. Further, the Air District, Cal EPA, the US EPA and the World Health Organization, all find that, "people exposed to PM at levels below the current EPA standards may still experience negative health effects." (BAAQMD, 2012 p 17). There are no safe levels of particulate matter, and given high baseline pollution, every PM2.5 exposure increment will contribute to increased risk of mortality, morbidity, and lost productivity for Bay Area residents.
- This high baseline pollution is not uniformly or fairly distributed, "PM concentrations – and population exposure to PM – can vary significantly at the local scale... People who live or work near major roadways, ports, distribution centers, or other major emission sources... may be disproportionately exposed to certain types of PM (e.g. ultrafine particles)..." (BAAQMD, 2012, p 14) There is growing evidence that proximity to oil refineries places residents at disproportionate risk for adverse health outcomes. Appendix C provides a partial list of this evidence base. There is also documentation that residents in proximity to refineries are disproportionately vulnerable by virtue of race, economic standing, and higher prevalence of underlying health conditions (Cushing 2016, Pastor 2010). The final EIR should recognize as part of the current landscape that failure to prevent increased refinery emissions will have environmental justice repercussions since they will predominantly occur in communities where residents are low income and/or are people of color and already disproportionately burdened by poor underlying health and multiple-source pollution exposures.
- The draft EIR should recognize that state and local policy specifically precludes placing disproportionate burden on impacted, disadvantaged populations. Senate Bill 32 and Assembly

Bill 197 recognize and protect these populations by requiring consideration of equity and social costs in reducing greenhouse gases and equitable resolution of them, prioritizing direct emissions reductions at large stationary sources. CEQA and the District's own mission also affirm a health mandate. Protecting public health and eliminating health disparities are stated goals of the 2017 Clean Air Plan. Rule 12-16 should be understood in light of this state-level policy framework for environmental health protection and the District's own mission.

- Current conditions with regards to Bay Area emissions are not static. Instead, the setting for Rule 12-16 is trending toward increases in the processing of heavier, higher-emitting, lower quality crude oils, expansion of projects to do so, and expanding fossil fuel export. (BAAQMD, 2013) Switching to heavier crudes will inherently increase emissions of PM2.5 and greenhouse gases, making it imperative that measures be put in place to prevent these future increases in emissions, *in addition to* measures decreasing current emissions. Without the preventive caps offered by Rule 12-16, other District measures will be limited by a context of rising emissions.
- The corresponding increase in fossil fuel exports will lead to an increase in exogenous air pollution in the Bay Area since a portion of the byproducts of combustion of fossil fuels exported from the Bay Area will return to us from Asia through transpacific atmospheric transport. This exogenous air pollution will directly threaten health and also impede progress toward the targets and goals of the Clean Air Plan, 2017. Exogenous / overseas sources of pollution are of increasing concern as they have been directly implicated in deaths in local populations and documented as a greater proportion of exposure than locally-sourced pollution in some settings. (Annenberg 2014, Christensen 2015, Zhang 2007, 2008, 2009).

Lastly, the health comments submitted to the District in December 2016 were omitted from Appendix A of the draft EIR and we ask that they be included.

The signatories believe these adjustments are necessary for the EIR to be complete and accurate and respectfully request they be made in time for Rule 12-16's potential adoption in September.

APPENDIX A:

Impact of Rule 12-16 on mortality associated with exposure to PM2.5 from processing heavier oil in Bay Area refineries

Table 1 Potential health impact of 12-16: Averted all-cause deaths attributable to chronic exposures to oil refinery PM2.5 (see Appendix for calculations)

	Regional Population (9 Bay Area Counties)			Impacted Population* (≤2.5 miles from refinery)		
	Low	Med	High	Low	Med	High
PARAMETERS						
Risk						
a. Risk of all-cause death for adults (>30 yrs) per 1µg/m ³ PM2.5 increase in long-term exposure	1.008	1.01	1.012	1.008	1.01	1.012
b. Incremental Risk: risk of all-cause death for adults attributable to increment in long-term PM2.5 exposure (risk/ per 1µg/m ³ PM2.5 increase)	0.008	0.01	0.012	0.008	0.01	0.012
Exposure						
c. Baseline anthropogenic** exposure (µg/m ³ PM _{2.5})		5.7			5.1	
d. Proportion of baseline anthropogenic exposure attributable to baseline refinery activity		.05			0.5	
e. Percent change from baseline anthropogenic emissions due to higher emitting oil emissions	40%	70%	100%	40%	70%	100%
f. Conversion factor (change in PM2.5 exposure per change in PM2.5 emissions)		0.5		0.4	0.5	0.6
g. Averted exposure: the annual increased PM2.5 concentration attributed to heavier oil that is averted by Rule 12-16 (µg/m ³ PM _{2.5})	0.057	0.10	0.143	0.408	0.893	1.53
Population and Mortality						
h. Adult Population (>25)		5,144,345			81,666	
i. Base all-cause adult death rate / person / year		0.0083403			0.0091899	
IMPACT						
j. Prevented adult all-cause deaths due to 12-16 averting increases in heavier oil PM2.5 emissions***	20	43	73	2	7	14
k. Rate of prevented adult all-cause death due to 12-16 averting increases in heavier oil PM2.5 emissions /100,000 population /yr	0.38	0.83	1.43	3.00	8.21	16.88
l. Cumulative prevented deaths due to 12-16 (40 yrs)	800	1700	2900	98	270	550

* The distance of 2.5 miles was selected to correspond with findings from Brody (2009) and Pastor (2010). Those living < 2.5 miles of refineries (Table 5) can roughly be interpreted as a proxy for impacted, vulnerable, and/or Environmental Justice populations. The Air District’s CARE program prioritizes communities and populations most impacted by air pollution, i.e., those with higher air pollution levels and worse health outcomes for diseases affected by air pollutions. Vulnerable populations also include those with heightened vulnerability to PM due to age (<5, elderly), low SES, minority race/ethnic status, and underlying health conditions. This proxy is conservative because *disparate impacts on vulnerable populations may occur beyond 2.5 miles.*

** Anthropogenic exposure is the ambient PM2.5 concentration above background levels (e.g., from sea salt).

*** Annual and cumulative deaths are presented as whole numbers. The resulting rounding error explains any discrepancy between presented deaths and rate.

Notes for Table 1

a. For every $1\mu\text{g}/\text{m}^3$ PM_{2.5} increase in exposure there is x% increased risk of all-cause mortality, e.g., a 1% increased risk of all-cause death per $1\mu\text{g}/\text{m}^3$ PM_{2.5} exposure increase. Risk estimates are from BAAQMD's literature review, of for example Pope et. al (2002), Krewsk et. al, (2000), and others. Risk may be underestimated as it does not account for 1) greater energy intensity and toxicity of PM_{2.5} associated with heavy oil and natural refining, 2) ultrafine PM, and 3) greater vulnerability of impacted populations.

b. Calculated as (all cause death risk in exposed) – (all cause death risk in unexposed), i.e, (risk per increase of $1\mu\text{g}/\text{m}^3$ PM_{2.5}) – (no increase in exposure) = $1.01 - 1 = .01$. For every exposure change of $1\mu\text{g}/\text{m}^3$ PM_{2.5} there is a corresponding 1% change in all-cause mortality attributable to PM_{2.5}

c. *Regional:* CAP 2017 p C/7

Impacted Population (<2.5 miles from refinery): From Brody et. al.(2009) baseline PM_{2.5} exposure was directly measured in Richmond at distances approximately 2.5 miles from the dominant PM_{2.5} source in the refinery. To isolate exposure above background, control site measures in Bolinas were subtracted from Richmond measures, yielding $\mu\text{g}/\text{m}^3$ PM_{2.5}. The PM_{2.5} was chemically fingerprinted to the refinery, finding, for example, high levels, of vanadium and nickel, which in this setting are isolated to refinery emissions (versus traffic). Validating this measure, CARB "ADAM" data for 2013 subtracts annual mean PM_{2.5} measures at Pt. Reyes from measures at the monitoring station nearest to the refinery, yielding $5.04\mu\text{g}/\text{m}^3$ PM_{2.5}. A baseline exposure of $4.5\mu\text{g}/\text{m}^3$ PM_{2.5} likely underestimates annual exposure because 1) the Brody study was conducted during the summer when PM_{2.5} concentrations are lowest and 2) Due to wind patterns, and refinery distribution, populations near the other refineries may experience a concentrating of PM_{2.5}. For these reasons, a conservative adjustment was made to factor in higher wintertime concentrations. The annual median concentration was divided by the median concentration Apr–Sep for three years of monitoring at the three closes sites (San Pablo, Vallejo, Concord). The mean of the resulting ratios was multiplied by the Brody measure (2009) such that $4.5 \times 1.13 = 5.1\mu\text{g}/\text{m}^3$ PM_{2.5} anthropogenic [].

d. Portion of the baseline anthropogenic exposure that is attributable to baseline refinery activity

Regional: CAP, 2017 p 2/20

Impacted Population: We set the portion at .5 since Brody et. al. (2009) used chemical fingerprinting to find that heavy oil combustion (refineries being the predominant source in the study area) is the most important contributor, more important than traffic, to elevated anthropogenic PM_{2.5} concentrations in the study area (<2.5 miles from refinery). We consider this measure reasonable in light of 1) BAAQMD grid modeling that ranged from .2 - .6, 2) an independent assessment of the Districts aerial emissions intensity data (2015) found that, on a mass/mile² basis, within 2.5 miles of the refineries, the areal source strength is more than twice (0.7) the regional average for all sources (CBE, 2015), and 3) accommodation of some lofting of emissions from hot stacks (2017 Staff Report). These parameters nevertheless likely underestimate, since downwind refinery communities could experience consolidation of PM_{2.5} from multiple refineries. Further, statewide analyses link high exposure to refinery proximity (<2.5 miles) (Pastor et. al. 2010).

e. Karras (2016) estimated a range of annual tons of PM_{2.5} emissions that Rule 12-16 would avert, such that, meaning that annually, Rule 12-16 would prevent increases of 364, 728, or 1090 short tons PM_{2.5} / yr of heavier oil-associated emission, or 40%, 70%, and 100% from current refinery emission rates could be averted through Rule 12-16. Medium Case (0.7) is the midpoint of the 0.4 - 1.0 range

f. The conversion factor translates emissions into exposure. It is derived from the regional weighted average change in PM_{2.5} exposure for a given change in direct emissions of PM_{2.5}. Verified by measurements and assuming a 24 hour “backyard exposure,” BAAQMD modeled PM_{2.5} exposure change on a region-wide 4x4km grid relative to a 20% reduction in all-source PM_{2.5} emissions finding a range from .2 - .6. (CAP, 2017 D/13),

Regional: We applied .5 as the central measure to recognize that the location of population, emission sources, and meteorological conditions coincide. BAAQMD also applied approximately .5 for their regional average conversion. The conversion factor may underestimate impacted population exposures since refineries are strong PM_{2.5} emission sources near densely populated communities.

Impacted Population: For the <2.5 miles group, given population density and proximity to refineries, which are strong emitters, we used .4 for the lower bound. The upper bound, .6, may underestimate exposure for this group, given monitoring station locations.

g. The increased concentration of PM_{2.5} (exposure) attributed to heavier oil refining that is averted by Rule 12-16 ($\mu\text{g}/\text{m}^3$ PM_{2.5}). Calculated as (baseline total anthropogenic exposure) x (portion of baseline anthropogenic exposure attributable to baseline refinery emissions) x (Portion change from baseline anthropogenic emissions due to higher emitting oil emissions that is averted by 12-16) x (conversion factor). For the Medium regional case: $5.7 \mu\text{g}/\text{m}^3 \text{ PM}_{2.5} \times .05 \times .7 \times .5 = 0.10 \mu\text{g}/\text{m}^3 \text{ PM}_{2.5}$. The attributable exposure may be underestimated because it does not account for: 1). NO_x and SO₂ PM-precursor emissions, and 2) the greater concentration of toxics associated with refining of heavy crude feedstock.

h. See Tables 2 and 3

i. Calculated as (annual deaths / total population) / yr. May overestimate or underestimate death rate over time should risk factors systematically improve or worsen.

j. Prevented deaths calculated as Attributable Risk x Attributable Exposure x all-cause per cap death rate x population. For middle regional scenario: $.01 \times .1 \times .00589 \times 7,447,686 = 44$ deaths prevented by Rule 12-16.

k. Calculated as (deaths prevented / population) x 100,000 population / year.

l. Cumulative Impact calculated as deaths prevented x 40 years, since capital projects to accommodate heavier crude feedstock generally operate for 30 - 50 years. This number underestimates cumulative impact if population increases, as is anticipated.

Table 2. Bay Area communities ≤ 2.5 miles from refineries; local-scale population data ^a

Census	Refinery ^b	Tract distance to fence line (miles)		Fraction ^c	Population	
Tract	≤ 2.5 miles	closest	furthest	≤ 2.5 miles	Total	≤ 2.5 miles
3650.02	Chevron	0.5	2.5	1.00	5,462	5,462
3660.02	Chevron	2.3	3.3	0.20	6,093	1,219
3680.01	Chevron	1.5	2.5	1.00	5,327	5,327
3680.02	Chevron	2.0	2.7	0.71	3,404	2,431
3720	Chevron	1.8	3.1	0.54	7,353	3,959
3740	Chevron	2.0	2.8	0.63	4,506	2,816
3750	Chevron	1.3	1.8	1.00	4,389	4,389
3760	Chevron	0.4	1.5	1.00	5,962	5,962
3770	Chevron	0.4	2.4	1.00	6,962	6,962
3780	Chevron	0.0	3.1	0.81	3,435	2,770
3790	Chevron	1.1	3.1	0.70	6,117	4,282
2506.04	Phillips 66	2.1	3.7	0.25	3,842	961
3560.01	Phillips 66	0.0	3.5	0.71	3,759	2,685
3570	Phillips 66	1.0	5.5	0.33	3,018	1,006
3580	Phillips 66	0.0	2.0	1.00	5,298	5,298
3591.04	Phillips 66	2.0	3.0	0.50	1,932	966
3591.05	Phillips 66	2.0	3.0	0.50	4,542	2,271
3592.03	Phillips 66	1.0	3.3	0.65	6,726	4,387
3923	Phillips 66	1.0	2.0	1.00	3,102	3,102
3150	Shell &/or Tesoro	0.0	7.0	0.36	3,281	1,172
3160	Shell &/or Tesoro	0.5	2.0	1.00	1,483	1,483
3170	Shell &/or Tesoro	0.1	1.0	1.00	2,144	2,144
3180	Shell &/or Tesoro	0.7	4.7	0.45	3,267	1,470
3190	Shell &/or Tesoro	0.2	2.0	1.00	7,412	7,412
3200.01	Shell &/or Tesoro	0.0	2.0	1.00	3,615	3,615
3200.03	Shell &/or Tesoro	0.7	1.6	1.00	2,805	2,805
3200.04	Shell &/or Tesoro	0.2	2.0	1.00	6,216	6,216
3211.01	Shell &/or Tesoro	1.4	2.5	1.00	6,549	6,549
3270	Shell &/or Tesoro	2.0	6.0	0.13	6,695	837
3290	Shell &/or Tesoro	2.0	3.6	0.31	6,309	1,972
2520	Valero	1.8	3.5	0.41	4,157	1,712
2521.02	Valero	0.0	6.0	0.42	3,874	1,614
2521.04	Valero	0.0	4.0	0.63	5,536	3,460
2521.05	Valero	1.7	3.0	0.62	3,256	2,004
2521.06	Valero	0.5	2.0	1.00	4,132	4,132
2521.07	Valero	0.0	1.5	1.00	3,592	3,592
2521.08	Valero	1.0	2.0	1.00	3,165	3,165
		Sum of these tract data:			168,717	121,608

a) 2010 Census: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table

b) Plant or plants within 2.5 miles of part or all of the census tract, identified by current owner/operator.

c) Estimation of population for tracts partly within a 2.5-mile radius: Tract fraction ≤ 2.5 miles = (2.5 - distance of bisection with radius in miles) ÷ (furthest distance - bisection distance in miles). Results are used to estimate the fraction of the total tract population ≤ 2.5 miles from a refinery. This method's simplifying assumption that population is distributed evenly within each tract despite geography and distance from refineries may result in overestimates or underestimates of local-scale population for those tracts that are partly within 2.5 miles of a refinery.

Table 3. Demographic and Vital Statistics for Bay Area Counties, 2013

Counties	Age Group (years)											TOTAL
	<1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	
Alameda												
Deaths	88	10	21	117	160	260	647	1,270	1,604	2,041	3,376	9,597
Population	19,493	76,842	190,900	203,954	232,027	231,327	222,525	191,268	111,600	55,333	28,101	1,563,370
Death Rate*	451.4	13.0	11.0	57.4	69.0	112.4	290.8	664.0	1437.3	3688.6	12013.8	613.9
Contra Costa												
Deaths	50	8	9	77	110	162	439	835	1,235	1,647	2,576	7,148
Population	12,240	49,755	146,153	145,402	129,256	143,616	163,677	140,700	86,747	42,739	21,577	1,081,862
Death Rate	408.5	16.1	6.2	53.0	85.1	112.8	268.2	593.5	1423.7	3853.6	11938.6	660.7
Marin												
Deaths	13	3	3	15	16	32	96	169	269	422	849	1,887
Population	2,334	9,858	30,334	26,078	23,766	32,876	41,089	40,325	28,899	13,245	7,460	256,264
Death Rate	557.0	30.4	9.9	57.5	67.3	97.3	233.6	419.1	930.8	3186.1	11380.7	736.4
Napa												
Deaths	6	1	1	9	10	23	51	125	188	269	511	1,194
Population	1,412	6,196	17,164	19,139	17,225	17,305	19,546	18,767	12,674	6,715	3,688	139,831
Death Rate	424.9	16.1	5.8	47.0	58.1	132.9	260.9	666.1	1483.4	4006.0	13855.7	853.9
San Francisco												
Deaths	30	4	6	40	91	172	351	749	809	1,268	2,134	5,655
Population	9,034	32,463	58,301	78,811	172,506	144,989	112,817	102,892	63,511	38,509	19,994	833,827
Death Rate	332.1	12.3	10.3	50.8	52.8	118.6	311.1	727.9	1273.8	3292.7	10673.2	678.2
San Mateo												
Deaths	19	2	5	35	52	94	257	477	673	1,102	1,920	4,636
Population	9,031	36,415	90,434	83,106	96,589	107,539	110,625	97,585	60,491	32,391	17,651	741,857
Death Rate	210.4	5.5	5.5	42.1	53.8	87.4	232.3	488.8	1112.6	3402.2	10877.6	624.9
Santa Clara												
Deaths	83	12	16	99	117	232	571	1,041	1,388	2,314	3,584	9,457
Population	24,112	95,493	245,789	228,340	264,949	282,446	270,707	211,136	126,347	68,609	32,667	1,850,595
Death Rate	344.2	12.6	6.5	43.4	44.2	82.1	210.9	493.0	1098.6	3372.7	10971.3	511.0
Solano												
Deaths	29	5	7	48	68	93	187	442	520	722	851	2,972
Population	5,127	20,641	55,419	59,872	56,830	53,419	61,449	56,360	32,286	15,914	6,731	424,048
Death Rate	565.6	24.2	12.6	80.2	119.7	174.1	304.3	784.2	1610.6	4536.9	12643.0	700.9
Sonoma												
Deaths	17	5	7	30	47	67	215	519	626	893	1,606	4,032
Population	5,070	21,413	58,627	65,627	64,121	59,350	69,251	71,808	45,050	20,879	11,874	493,070
Death Rate	335.3	23.4	11.9	45.7	73.3	112.9	310.5	722.8	1389.6	4277.0	13525.3	817.7
Bay Area												
Deaths	335	50	75	470	671	1135	2814	5627	7312	10678	17407	46578
Population	87853	349076	893121	910329	1057269	1072867	1071686	930841	567605	294334	149743	7384724
Death Rate	381.3	14.3	8.4	51.6	63.5	105.8	262.6	604.5	1288.2	3627.9	11624.6	630.7
<2.5 miles from refinery**												
Deaths	6	1	1	10	14	21	51	103	142	191	277	817
Population	1,402	5,685	16,278	16,577	15,027	15,911	18,180	15,913	9,612	4,736	2,286	121,608
Death Rate	454.9	18.5	7.9	60.9	95.7	129.4	278.1	648.0	1474.4	4039.0	12106.1	672.0

	Regional			<2.5miles		
	Death	Pop	Rt.	Death	Pop	Rt.
Adults >25 yr***	42905	5,144,345	834.03	751	81,666	918.992

*Death rates are age-specific expressed per 100,000 population. Age-adjusted rates are calculated using the 2000 U.S. Standard Population.

** Deaths in the Impacted Population (<2.5 miles from refinery) were derived using a death rate that divided Contra Costa and Solano Counties' combined deaths by their combined populations and applying this rate to the population living within 2.5 miles of a refinery for one year (from Table 2) $(9,521 \div 1,518,002) \times 121,608 = 763$. This estimate may underestimate refinery effects on impacted populations because baseline death rates in communities near refineries may be greater than county-wide average rates. The age specific populations and deaths for the <2.5 miles group were arrived at by multiplying the total population by the age-specific death and population distribution of the combined Contra Costa and Solano Counties.

***The total adult deaths were adjusted to remove suicides and accidents by multiplying the unadjusted total by 6%, which represented the average and most frequent percent of deaths by suicide/accident for each county.

Population \leq 2.5 miles from refinery fence lines estimated from census tract data. See Table 2

Source: State of California, Department of Public Health, Death Records. State of California, Department of Finance, Race/Ethnic Population with Age and Sex Detail, 2010-2060. Sacramento, CA, December 2014

State of California, Department of Finance, Race/Ethnic Population with Age and Sex Detail, 2010-2060. Sacramento, CA, December 2014.

APPENDIX B

Summary of pollutant – health outcome pairs to inform
fuller health assessment of the No-Project Alternative

Table 1 Pollutant–health outcome pairs for which HRAPIE project recommends concentration–response functions (modified from WHO 2013b)

Pollutant metric	Health outcome	Group	RR (95 % CI) per 10 µg/m ³
PM _{2.5} , annual mean	Mortality, all-cause (natural), age 30+ years	A*	1.062 (1.040–1.083)
PM _{2.5} , annual mean	Mortality, cerebrovascular disease (includes stroke), ischaemic heart disease, COPD and trachea, bronchus and lung cancer, age 30+ years	A	GBD 2010 study (IHME 2013) ^a
PM ₁₀ , annual mean	Postneonatal (age 1–12 months) infant mortality, all-cause	B*	1.04 (1.02, 1.07)
PM ₁₀ , annual mean	Prevalence of bronchitis in children, age 6–12 (or 6–18) years	B*	1.08 (0.98–1.19)
PM ₁₀ , annual mean	Incidence of chronic bronchitis in adults (age 18+ years)	B*	1.117 (1.040–1.189)
PM _{2.5} , daily mean	Mortality, all-cause, all ages	A	1.0123 (1.0045–1.0201)
PM _{2.5} , daily mean	Hospital admissions, CVDs (including stroke), all ages	A*	1.0091 (1.0017–1.0166)
PM _{2.5} , daily mean	Hospital admissions, respiratory diseases, all ages	A*	1.0190 (0.9982–1.0402)
PM _{2.5} , 2-week average, converted to PM _{2.5} , annual average	RADs, all ages	B**	1.047 (1.042–1.053)
PM _{2.5} , 2-week average, converted to PM _{2.5} , annual average	Work days lost, working-age population (age 20–65 years)	B*	1.046 (1.039–1.053)
PM ₁₀ , daily mean	Incidence of asthma symptoms in asthmatic children aged 5–19 years	B*	1.028 (1.006–1.051)
O ₃ , summer months (April–September), average of daily maximum 8-h mean over 35 ppb	Mortality, respiratory diseases, age 30+ years	B	1.014 (1.005–1.024)
O ₃ , daily maximum 8-h mean over 35 ppb	Mortality, all (natural) causes, all ages	A*	1.0029 (1.0014–1.0043)
O ₃ , daily maximum 8-h mean over 10 ppb	Mortality, all (natural) causes, all ages	A	1.0029 (1.0014–1.0043)
O ₃ , daily maximum 8-h mean over 35 ppb	Mortality, CVDs and respiratory diseases, all ages	A	CVD: 1.0049 (1.0013–1.0085); respiratory: 1.0029 (0.9989–1.0070)
O ₃ , daily maximum 8-h mean over 10 ppb	Mortality, CVDs and respiratory diseases, all ages	A	CVD: 1.0049 (1.0013–1.0085); respiratory: 1.0029 (0.9989–1.0070)
O ₃ , daily maximum 8-h mean over 35 ppb	Hospital admissions, CVDs (excluding stroke) and respiratory diseases, age 65+ years	A*	CVD: 1.0089 (1.0050–1.0127); respiratory: 1.0044 (1.0007–1.0083)
O ₃ , daily maximum 8-h mean over 10 ppb	Hospital admissions, CVDs (excluding stroke) and respiratory diseases, age 65+ years	A	CVD: 1.0089 (1.0050–1.0127); respiratory: 1.0044 (1.0007–1.0083)
O ₃ , daily maximum 8-h mean over 35 ppb	MRADs, all ages	B*	1.0154 (1.0060–1.0249)
O ₃ , daily maximum 8-h mean over 10 ppb	MRADs, all ages	B	1.0154 (1.0060–1.0249)
NO ₂ , annual mean over 20 µg/m ³	Mortality, all (natural) causes, age 30+ years	B*	1.055 (1.031–1.080)
NO ₂ , annual mean	Prevalence of bronchitic symptoms in asthmatic children aged 5–14 years	B*	1.021 (0.990–1.060) per 1 µg/m ³ change in annual mean NO ₂
NO ₂ , daily maximum 1-h mean	Mortality, all (natural) causes, all ages	A*	1.0027 (1.0016–1.0038)
NO ₂ , daily maximum 1-h mean	Hospital admissions, respiratory diseases, all ages	A	1.0015 (0.9992–1.0038)

APPENDIX C:

Partial listing of evidence establishing association between residential proximity to refineries and adverse health outcomes

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Specifically, SB 32 Sec. 1 (d) and AB 197 Sec. 1 (c), (e), Sec. 5

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Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

BY CERTIFIED MAIL AND EMAIL

December 07, 2018

Mr. David Joe
Office of Rules and Strategic Policy
Bay Area Air Quality Management District (BAAQMD)
375 Beale Street, Suite 600
San Francisco, CA 94105

Subject: Shell Comments on Staff Report and DEIR for AB 617 Expedited BARCT Implementation Schedule

Dear Mr. Joe:

The Shell Martinez Refinery (Shell) is writing this letter to provide comments on the revised Staff Report on the Assembly Bill 617 (AB 617) Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule and Draft Environmental Impact Report (DEIR), dated October of 2018.

Staff Report

In a letter dated October 5, 2018, Shell provided BAAQMD comments on the prior Initial Staff Report issued in September of 2018. The comments in the October 5, 2018 letter are still applicable and are attached to this letter.

DEIR

Chapter 3.4 of the DEIR, "Hydrology and Water Quality," concludes that the installation and operation of a wet gas scrubber (WGS) to control sulfur oxide emissions would result in significant impacts on water demand. More specifically, the DEIR estimates the expected water demand may be up to 300 gallons per minute or 432,000 gallons per day for each WGS. The DEIR states that up to three WGS may be installed in the San Francisco Bay Area to comply with the proposed Expedited BARCT Implementation Schedule, which would result in total water demand of up to 1,296,000 gallons per day. Shell appreciates BAAQMD acknowledging the significant impact on water demand that would result from the installation and operation of a WGS.

However, the DEIR states, "it is not expected that wastewater would exceed a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits" and that "water quality impacts during operation are concluded to be less than significant." These conclusions cannot be made without further analysis. For example, assuming that a new WGS system at Shell would generate up to 300 gallons per minute of new wastewater, Shell would need to upgrade the existing wastewater infrastructure to address potential sewer bottlenecks and overall capacity. In addition, Shell would need to update the National Pollutant Discharge Elimination

System (NPDES) permit to address the changes in the wastewater treatment system and potential increase in contaminants. BAAQMD should either perform a more complete analysis of water quality impacts to correctly characterize the impacts or, if information is not currently available to show otherwise, conclude that impacts on water quality may be potential significant.

Shell is looking forward to continuing to work with BAAQMD staff to further discuss these concerns and determine a path forward.

Please contact Rick Shih at 925-313-0586 if you would like to discuss these issues in more detail.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Gordon Johnson', with a horizontal line extending to the right.

Gordon Johnson
Manager, Environmental
Shell Oil Products, US – Martinez Refinery

Attachment:

Shell Comment Letter Dated October 5, 2018



Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

CERTIFIED MAIL AND EMAIL

October 05, 2018

Mr. David Joe
Office of Rules and Strategic Policy
Bay Area Air Quality Management District (BAAQMD)
375 Beale Street, Suite 600
San Francisco, CA 94105

Subject: Shell Comments on Initial Staff Report for AB 617 Expedited BARCT Implementation Schedule

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The Shell Martinez Refinery (Shell) is writing this letter to provide comments on the Initial Staff Report on the Assembly Bill 617 (AB 617) Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule (dated September of 2018). The focus of Shell's comments is on the Rule Development Project Scope for fluidized catalytic cracking units (FCCU) and carbon monoxide (CO) Boilers attached to the Initial Staff Report (referred to as Project Scope in this letter). Shell previously provided BAAQMD Shell's initial comments to the draft Project Scope issued in May of 2018. Those initial comments that are still applicable are also reiterated below.

Additional Studies Required Prior to Rule Implementation

The Staff Report states that additional testing and time to gather more information may be needed for the BARCT Refinery FCCU and CO Boiler rule. In fact, BAAQMD has adjusted the proposed implementation schedule to better account for the additional time needed. Shell appreciates BAAQMD recognition of the importance of thorough information gathering necessary to obtain accurate data on potential emission reductions and data on cost of controls to calculate the cost effectiveness of a proposed BARCT rule.

More specifically, the Project Scope for FCCU and CO Boilers notes the need for additional testing and study to properly characterize condensable PM emissions from the CO Boilers. Due to the flow patterns in Shell's CO Boiler stacks, BAAQMD staff agree that current EPA test methodologies are not able to accurately measure condensable particulate in these stacks. Shell agrees further testing and study is needed to properly characterize condensable particulate emissions.

Attainment for SO₂ and Non-attainment for PM

AB617 requires BARCT implementation in non-attainment areas. Although the Bay Area is in attainment for sulfur dioxide (SO₂), BAAQMD staff focuses on SO₂ emission reductions in the Project Scope for FCCU and CO Boilers because SO₂ emissions can lead to the formation of condensable PM. Shell believes instead that the cost effectiveness for this BARCT rule should be based on the emission reductions of the non-attainment pollutant (PM) rather than on the attainment pollutant (SO₂). However,

until the condensable PM emissions can be accurately measured from the CO Boiler stacks, the condensable PM reductions as a result of SO₂ reductions cannot be accurately determined for use in the cost effectiveness calculations. Therefore, until additional information on condensable PM from SO₂ can be obtained, it will be difficult to develop a BARCT rule.

New/Reconstructed/Modified versus Existing (BACT versus BARCT)

The Project Scope sets a preliminary SO₂ BARCT level of 50 parts per million by volume (ppmv) on a seven-day rolling average and 25 ppmv on a 365-day rolling average based on Best Available Control Technology (BACT) guidelines and New Source Performance Standards (NSPS) Subpart Ja for newly constructed, reconstructed and modified units. BAAQMD staff believes this will require the use of wet gas scrubbers (WGS).

By definition, BARCT is retrofit technology for an existing unit, which is not the same as new units or those being reconstructed or modified. Therefore, the BACT and NSPS Subpart Ja standards should not be used as a basis for BARCT.

WGS Cost Effectiveness

The current cost effectiveness estimates presented in the Project Scope severely underestimate the actual costs.

Capital Cost: BAAQMD estimates the costs for retrofitting an existing FCCU/CO Boiler with a WGS to be \$135 million. The basis for this estimate is not detailed in the report. Shell believes the actual capital costs would be significantly greater. As explained below, Shell believes the cost will be over \$700 million.

BAAQMD's own engineering evaluation in 2008 identified capital costs of up to \$200 million for a WGS to be installed in Delaware (2008 Application#17798 for Tesoro, Plant No. 14628). Using this \$200 million cost and adjusting to account for inflation, the 2018 capital costs would be \$234 million. Even the \$234 million value is a significant underestimate of actual costs to install a WGS at Shell. Examples of why the costs are understated are described below:

- The \$234 million value is based on costs in Delaware but the cost to install a WGS in the Bay Area would be significantly higher due to the high construction cost in the Bay Area.
- As the engineering evaluation referenced above states, the capital cost estimates did not include costs associated with upgrades that would be needed for existing equipment. For example, Shell would need to replace the existing CO Boilers with new CO boilers that work at the higher pressures of the WGS system. New boilers could also trigger the installation of selective catalytic reduction (SCR) units for NO_x control. The permitting, design and construction of new boilers would add significant costs.
- Due to the existing lack of free space at the Catalytic Cracking Unit and CO Boilers, the likelihood of identifying an area to accommodate the WGS and new CO Boilers footprint is highly unlikely. Given the limited space near the existing CO Boilers and if a feasible location can be found for the WGS, a significant amount of piping and infrastructure would be required to route the exhaust from the CCU to the new CO Boilers to the proposed WGS. Again, Shell strongly believes it is unlikely an area would be identified to accommodate the footprint of new CO Boilers and a WG.
- It is Shell's understanding that a recently built WGS project at Valero cost over \$700 million, if not higher over 10 years ago.

Table 1 summarizes the costs presented above. Considering the above factors, Shell believes the actual capital cost to install a WGS at the refinery would be at least \$700 million.

Table 1. Summary of Capital Costs

Basis	BAAQMD Sept 2018 Project Scope	BAAQMD 2008 Tesoro Permit Evaluation Adjusted for Inflation	Shell Estimate ¹
Capital Cost	\$135 Million	\$234 Million	>700 Million

¹With Site Specific Considerations and Valero Actual Costs

Operating Cost: In addition, the operating costs are significantly greater than what is used in the Project Scope. Based on factors presented in the Initial Staff report, the annual maintenance and operating cost used in the Project Scope appears to be about \$9 million per year. This is in contrast to the \$26 million per year operating cost based on the Tesoro engineering evaluation (after adjusting the listed \$22 million per year for inflation). Operating and maintenance costs for WGS need to account for the additional energy and water usage; the more frequent maintenance required to address corrosion in the WGS; and additional cost of disposing liquid and solid waste, which may be hazardous (e.g., cost of laboratory analysis, handling and transportation, treatment, and final disposal).

Cost Effectiveness: Using the conservatively low 2018 capital costs of \$234 million and the same annualized factors used in the 2008 engineering evaluation, the annualized capital cost would be \$47 million per year. Adding this 2018 annualized capital cost and the 2018 operating cost of \$26 million per year, the total annualized cost would be \$73 million per year. Based on a potential reduction of 567 tons per year estimated by BAAQMD, the resulting cost effectiveness would then be \$130,000 per ton.

Using the Shell Martinez estimate of at least \$700 million, the annualized factors used in the 2008 engineering evaluation, and the same \$26 million per year operating cost, the cost effectiveness would be at least \$300,000 per ton. The Project Scope's estimate of \$47,000 per ton significantly underestimates the cost-effectiveness of the WGS. Table 2 summarizes the cost effectiveness results presented above.

Considering BAAQMD's low capital and operating cost estimates, Shell requests BAAQMD provide more details on the basis for BAAQMD's cost estimates. For example, what was BAAQMD's basis for the \$135 million capital cost estimate? Also, the Initial Staff Report lists the factors to estimate annual cost from the capital cost. However, the General and Administrative cost factor (identified as typically being 2 percent of the capital cost in BAAQMD's BACT Policy and Implementation Procedure) was not listed and does not appear to have been considered.

Table 2. Summary of Cost Effectiveness

Basis	BAAQMD Project Scope September 2018	BAAQMD 2008 Tesoro Permit Evaluation Adjusted for Inflation	Shell Estimate ¹
Cost Effectiveness	\$47,000 per ton	\$130,000 per ton	>\$300,000 per ton

¹With Site Specific Considerations and Valero Actual Costs

WGS – GHG, Energy, Water and other Environmental Impact Considerations

By requiring the installation of WGS on a FCCU, GHG emissions will increase as a result of the higher energy demand to operate a WGS. Thus, while the use of a WGS may result in a decrease in CCU criteria pollutants, facility wide GHG emissions and energy use will increase. In addition, there will be other environmental impacts from the construction and operation of a WGS.

In particular, the increased water use for a WGS must be carefully evaluated and considered. Also, the liquid purged from the WGS will need to be appropriately treated before discharging or reusing the liquid. This will result in the generation of additional waste water and solid waste (potentially hazardous waste) as well as potentially new wastewater treatment equipment. Also, the use of a WGS would likely result in a colder, saturated plume that would not disperse as effectively as exhaust going through the current CO Boiler stacks, thereby countering some of the benefits of reduced emissions to local receptors. These impacts must be considered when determining the overall benefit of the rule.

Catalyst Additives

In addition, the Project Scope notes that further study is needed to assess the use of a catalyst additive to reduce SO₂ emissions. Shell is not aware of any data that demonstrates Data is not currently proposed BARCT levels can be achieved through the use of catalyst additives. Shell agrees further study and testing is needed to properly assess the cost and benefits of using catalyst additive to reduce SO₂ emissions.

Summary

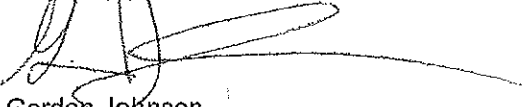
In summary, Shell has the following comments:

- **Additional PM Studies:** To develop an effective rule, additional studies are needed to accurately characterize any potential PM emission reductions.
- **Attainment:** Since the area is in attainment of SO₂ and non-attainment of PM standards, the cost-effectiveness should be based on PM emission reductions (which again cannot be accurately determined without further study).
- **Retrofit vs New/Modified:** The proposed SO₂ limits are based on BACT guidelines and NSPS, both of which are for newly constructed, reconstructed, and modified units. However, BARCT applies to the retrofit of existing units not being reconstructed or modified and so the proposed limits are not appropriate.
- **WGS Cost Effectiveness:** The actual costs for retrofitting an existing FCCU/CO Boiler with a WGS are significantly greater than estimated by BAAQMD.
- **Other Environmental Impacts:** WGS would result in higher energy consumption, greater GHG emissions, increase water usage, and greater liquid and solid waste generation.
- **Catalyst Additives:** Additional studies would be needed to determine the potential emission reductions and cost effectiveness of catalyst additives.

Shell is looking forward to continuing to work with BAAQMD staff to further discuss these concerns and determine a path forward.

Please contact Rick Shih at 925-313-0586 if you would like to discuss these issues in more detail.

Very truly yours,



Gordon Johnson
Manager, Environmental
Shell Oil Products, US – Martinez Refinery

11800 Shoreline Highway
Point Reyes Station, CA 94956

December 7, 2018

BY ELECTRONIC MAIL

Board of Directors
Bay Area Air Quality Management District
c/o Marcy Hiratzka, Clerk of the Boards
375 Beale Street
San Francisco, CA 94105

RECEIVED

DEC 07 2018

CLERK OF
THE BOARDS

RE: December 19th Public Hearings on Proposed Rule Amendment 6-5 and BARCT Implementation

As concerned members of the communities you serve, we would like to call your attention to an ongoing situation that requires action on your part as members of the BAAQMD Board of Directors. This is an urgent matter of public health and welfare - the stated mission of the BAAQMD. On December 19th, 2018 the Board has scheduled Public Hearings on (I) Proposed Amendments to District Rules 6-5; and (II) on AB 617 Best Available Retrofit Control Technology (BARCT) Implementation Schedule.

(I) Proposed Amendments to Rule 6-5

For several years, leading California health professionals, scores of community and environmental protection advocates have been regularly attending meetings and providing comments and letters to the Air District Board, Technical Advisory Council, Stationary Source and Refinery Oversight Committee urging the District to do their job by requiring standard Best Available Control Technology (BACT) on refinery Fluidized Catalytic Cracking Units (FCCUs). Uncontrolled fine particulates from Bay area refineries have long impacted the air quality and health of surrounding communities, and indeed the Bay area at large. By requiring the use of wet scrubbing equipment under adopted Rule 6-5 – a proven technology already in use at the Valero Benecia refinery and at refineries around the country – emissions of PM2.5 (respirable) particulate could be reduced by greater than 95 percent. However, the current proposed revision of Rule 6-5 [Control Of Particulate Emissions from Refinery FCCUs] REMOVES condensable particulate matter (PM 2.5 and smaller) and sulfur dioxide (a precursor to particulate formation) from the list of pollutants intended for future FCCU control under this rule (Table 1). This retraction is what the District agreed to do in the "Enforcement Agreement/Agreement to Stay Litigation" signed with Bay area refineries in March 2017, without public scrutiny or accountability (see Article 3 on pages 4 and 5 of the Enforcement Agreement). We request that the Board reject the portion of this settlement concerning the above described changes to adopted Rule 6-5 and prepare to defend it in court for the protection of public health in the Bay Area and in furtherance of your mission.

(II) Proposed AB 617 BARCT Implementation Schedule

In the proposed BARCT Implementation Schedule refinery FCCUs are in one of the six categories to be evaluated for rule development, with a 2-year timeline (2019 to 2020). We believe that two more years of no control of FCCU PM2.5 emission is unacceptable, in light of the ongoing critical community health impacts of refinery particulate emissions. We request that emissions reductions from FCCUs begin immediately under adopted Rule 6-5 and not be delayed for another two years under the AB 617 BARCT Implementation Schedule.

It is our hope that, as BAAQMD Board members, you will firmly stand on the side of protecting public health and welfare from uncontrolled fine particulate pollution impacts.

Thank you for your consideration of these critical issues, now more urgent than ever as California (and countries around the world) struggles to meet air pollution reduction targets that are drastically affecting the earth's climate.

Sincerely,

W. Ellen Sweet
350Marin
West Marin Standing Together

Richard Gray
360 Bay Area

**Response to Comments for the Final Environmental Impact Report for
the Bay Area Air Quality Management District**

AB 617 Expedited BARCT Implementation Schedule Project

State Clearing House Number: 2018082003

Prepared for:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94105
Contact: David Joe
(415) 749-8623

Prepared By:

Environmental Audit, Inc.
1000-A Ortega Way
Placentia, CA 92870
Contact: Debra Bright Stevens
(714) 632-8521

December 2018

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1.0 INTRODUCTION

This Final Environmental Impact Report (FEIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.). According to CEQA Guidelines, Section 15132, the FEIR shall consist of:

- The Draft Environmental Impact Report (DEIR) or a revision of the Draft;
- Comments and recommendations received on the DEIR either verbatim or in summary;
- A list of persons, organizations, and public agencies comments on the DEIR;
- The responses of the Lead Agency to significant environmental points raised in the review and consultation process; and,
- Any other information added by the Lead Agency.

This Response to Comments, together with other portions of the DEIR as revised, constitutes the FEIR for the proposed AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule.

The DEIR contains a detailed project description, the environmental setting for each of the environmental resources topic areas where the Notice of Preparation and Initial Study (NOP/IS) determined there was a potential significant adverse impact, an analysis of the potentially significant environmental impacts including cumulative impacts, project alternatives, mitigation measures, and other areas of discussion as required by CEQA. The discussion of the project-related and cumulative environmental impacts included a detailed analysis of air quality, hazards and hazardous materials, and hydrology and water quality.

The DEIR was released on October 23, 2018 and circulated for a 45-day public review and comment period that ended on December 7, 2018. The DEIR is available at the Bay Area Air Quality Management District (BAAQMD), 375 Beale Street, Suite 600, San Francisco, California 94105. Copies can also be obtained by accessing the BAAQMD's website at <http://www.baaqmd.gov/ab617barct>. The BAAQMD received one comment letter on the Draft EIR during the public comment period. The comment letters and responses to the comments raised in those letters are provided in this document. The comments are bracketed and numbered. The related responses are identified with the corresponding number and are included following each comment letter.

1.1 FORMAT OF THIS DOCUMENT

The Final EIR for the Expedited BARCT Implementation Schedule consists of the Draft EIR and its technical appendices; the Responses to Comments included herein; and other written documentation prepared during the EIR process. The District would also consider adoption of a Statement of Findings of Fact and a Statement of Overriding Considerations as part of the approval process for the Project.

This Response to Comments document is organized as follows:

- Section 1 provides a brief introduction to this document.
- Section 2 identifies the Draft EIR commenters.
- Section 3 provides responses to substantive comments received on the Draft EIR. Responses are provided in the form of individual responses to comment letters received. Comment letters are followed immediately by the responses to each letter.
- Section 4 presents clarifications to the Draft EIR, identifying revisions to the text of the document.

1.2 CEQA REQUIREMENTS REGARDING COMMENTS AND RESPONSES

CEQA Guidelines Section 15204 (a) outlines parameters for submitting comments, and reminds persons and public agencies that the focus of review and comment of DEIRs should be “on the sufficiency of the document in identifying and analyzing possible impacts on the environment and ways in which significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. At the same time, reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible. CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good-faith effort at full disclosure is made in the EIR.”

CEQA Guidelines Section 15204 (c) further advises, “Reviewers should explain the basis for their comments, and should submit data or references offering facts, reasonable assumptions based on facts, or expert opinion supported by facts in support of the comments. Pursuant to Section 15064, an effect shall not be considered significant in the absence of substantial evidence.” Section 15204 (d) also states, “Each responsible agency and trustee agency shall focus its comments on environmental information germane to that agency’s statutory responsibility.” Section 15204 (e) states, “This section shall not be used to restrict the ability of reviewers to comment on the general adequacy of a document or of the lead agency to reject comments not focused as recommended by this section.”

2.0 COMMENTS RECEIVED ON THE DRAFT EIR

In accordance with the State CEQA Guidelines Section 15132, the following is a list of public agencies, organizations, individuals, and businesses that submitted comments on the Draft EIR received as of close of the public review period on December 7, 2018. Comments have been numbered and responses have been developed with corresponding numbers.

TABLE 2-1
Comment Letters with Responses Prepared

Comment Letter	Commenter	Date Received
1	Gordon Johnson, Shell Oil Products, U.S. Martinez Refinery	12/7/18

3.0 RESPONSES TO COMMENTS

This section includes responses to all substantive environmental issues raised in comments received on the Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule. Responses are provided for each of the comments received. This section is formatted so that the respective comment letters are followed immediately by the corresponding responses. Comment letters and specific comments are given letters and numbers, respectively, for reference purposes.

Comment Letter No. 1



Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

BY CERTIFIED MAIL AND EMAIL

December 07, 2018

Mr. David Joe
Office of Rules and Strategic Policy
Bay Area Air Quality Management District (BAAQMD)
375 Beale Street, Suite 600
San Francisco, CA 94105

Subject: Shell Comments on Staff Report and DEIR for AB 617 Expedited BARCT Implementation Schedule

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1-1

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1-2

However, the DEIR states, "it is not expected that wastewater would exceed a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits" and that "water quality impacts during operation are concluded to be less than significant." These conclusions cannot be made without further analysis. For example, assuming that a new WGS system at Shell would generate up to 300 gallons per minute of new wastewater, Shell would need to upgrade the existing wastewater infrastructure to address potential sewer bottlenecks and overall capacity. In addition, Shell would need to update the National Pollutant Discharge Elimination

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Please contact Rick Shih at 925-313-0586 if you would like to discuss these issues in more detail.

Very truly yours,



Gordon Johnson
Manager, Environmental
Shell Oil Products, US – Martinez Refinery

1-2
cont..

Attachment:

Shell Comment Letter Dated October 5, 2018



Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

CERTIFIED MAIL AND EMAIL

October 05, 2018

Mr. David Joe
Office of Rules and Strategic Policy
Bay Area Air Quality Management District (BAAQMD)
375 Beale Street, Suite 600
San Francisco, CA 94105

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More specifically, the Project Scope for FCCU and CO Boilers notes the need for additional testing and study to properly characterize condensable PM emissions from the CO Boilers. Due to the flow patterns in Shell's CO Boiler stacks, BAAQMD staff agree that current EPA test methodologies are not able to accurately measure condensable particulate in these stacks. Shell agrees further testing and study is needed to properly characterize condensable particulate emissions.

Attainment for SO₂ and Non-attainment for PM

AB617 requires BARCT implementation in non-attainment areas. Although the Bay Area is in attainment for sulfur dioxide (SO₂), BAAQMD staff focuses on SO₂ emission reductions in the Project Scope for FCCU and CO Boilers because SO₂ emissions can lead to the formation of condensable PM. Shell believes instead that the cost effectiveness for this BARCT rule should be based on the emission reductions of the non-attainment pollutant (PM) rather than on the attainment pollutant (SO₂). However,

1-5

until the condensable PM emissions can be accurately measured from the CO Boiler stacks, the condensable PM reductions as a result of SO₂ reductions cannot be accurately determined for use in the cost effectiveness calculations. Therefore, until additional information on condensable PM from SO₂ can be obtained, it will be difficult to develop a BARCT rule.

1-5
cont.

New/Reconstructed/Modified versus Existing (BACT versus BARCT)

The Project Scope sets a preliminary SO₂ BARCT level of 50 parts per million by volume (ppmv) on a seven-day rolling average and 25 ppmv on a 365-day rolling average based on Best Available Control Technology (BACT) guidelines and New Source Performance Standards (NSPS) Subpart Ja for newly constructed, reconstructed and modified units. BAAQMD staff believes this will require the use of wet gas scrubbers (WGS).

1-6

By definition, BARCT is retrofit technology for an existing unit, which is not the same as new units or those being reconstructed or modified. Therefore, the BACT and NSPS Subpart Ja standards should not be used as a basis for BARCT.

WGS Cost Effectiveness

The current cost effectiveness estimates presented in the Project Scope severely underestimate the actual costs.

Capital Cost: BAAQMD estimates the costs for retrofitting an existing FCCU/CO Boiler with a WGS to be \$135 million. The basis for this estimate is not detailed in the report. Shell believes the actual capital costs would be significantly greater. As explained below, Shell believes the cost will be over \$700 million.

BAAQMD's own engineering evaluation in 2008 identified capital costs of up to \$200 million for a WGS to be installed in Delaware (2008 Application#17798 for Tesoro, Plant No. 14628). Using this \$200 million cost and adjusting to account for inflation, the 2018 capital costs would be \$234 million. Even the \$234 million value is a significant underestimate of actual costs to install a WGS at Shell. Examples of why the costs are understated are described below:

- The \$234 million value is based on costs in Delaware but the cost to install a WGS in the Bay Area would be significantly higher due to the high construction cost in the Bay Area.
- As the engineering evaluation referenced above states, the capital cost estimates did not include costs associated with upgrades that would be needed for existing equipment. For example, Shell would need to replace the existing CO Boilers with new CO boilers that work at the higher pressures of the WGS system. New boilers could also trigger the installation of selective catalytic reduction (SCR) units for NO_x control. The permitting, design and construction of new boilers would add significant costs.
- Due to the existing lack of free space at the Catalytic Cracking Unit and CO Boilers, the likelihood of identifying an area to accommodate the WGS and new CO Boilers footprint is highly unlikely. Given the limited space near the existing CO Boilers and if a feasible location can be found for the WGS, a significant amount of piping and infrastructure would be required to route the exhaust from the CCU to the new CO Boilers to the proposed WGS. Again, Shell strongly believes it is unlikely an area would be identified to accommodate the footprint of new CO Boilers and a WG.
- It is Shell's understanding that a recently built WGS project at Valero cost over \$700 million, if not higher over 10 years ago.

1-7

Table 1 summarizes the costs presented above. Considering the above factors, Shell believes the actual capital cost to install a WGS at the refinery would be at least \$700 million.

Table 1. Summary of Capital Costs

Basis	BAAQMD Sept 2018 Project Scope	BAAQMD 2008 Tesoro Permit Evaluation Adjusted for Inflation	Shell Estimate ¹
Capital Cost	\$135 Million	\$234 Million	>700 Million

¹With Site Specific Considerations and Valero Actual Costs

Operating Cost: In addition, the operating costs are significantly greater than what is used in the Project Scope. Based on factors presented in the Initial Staff report, the annual maintenance and operating cost used in the Project Scope appears to be about \$9 million per year. This is in contrast to the \$26 million per year operating cost based on the Tesoro engineering evaluation (after adjusting the listed \$22 million per year for inflation). Operating and maintenance costs for WGS need to account for the additional energy and water usage; the more frequent maintenance required to address corrosion in the WGS; and additional cost of disposing liquid and solid waste, which may be hazardous (e.g., cost of laboratory analysis, handling and transportation, treatment, and final disposal).

Cost Effectiveness: Using the conservatively low 2018 capital costs of \$234 million and the same annualized factors used in the 2008 engineering evaluation, the annualized capital cost would be \$47 million per year. Adding this 2018 annualized capital cost and the 2018 operating cost of \$26 million per year, the total annualized cost would be \$73 million per year. Based on a potential reduction of 567 tons per year estimated by BAAQMD, the resulting cost effectiveness would then be \$130,000 per ton.

Using the Shell Martinez estimate of at least \$700 million, the annualized factors used in the 2008 engineering evaluation, and the same \$26 million per year operating cost, the cost effectiveness would be at least \$300,000 per ton. The Project Scope's estimate of \$47,000 per ton significantly underestimates the cost-effectiveness of the WGS. Table 2 summarizes the cost effectiveness results presented above.

Considering BAAQMD's low capital and operating cost estimates, Shell requests BAAQMD provide more details on the basis for BAAQMD's cost estimates. For example, what was BAAQMD's basis for the \$135 million capital cost estimate? Also, the Initial Staff Report lists the factors to estimate annual cost from the capital cost. However, the General and Administrative cost factor (identified as typically being 2 percent of the capital cost in BAAQMD's BACT Policy and Implementation Procedure) was not listed and does not appear to have been considered.

Table 2. Summary of Cost Effectiveness

Basis	BAAQMD Project Scope September 2018	BAAQMD 2008 Tesoro Permit Evaluation Adjusted for Inflation	Shell Estimate ¹
Cost Effectiveness	\$47,000 per ton	\$130,000 per ton	>\$300,000 per ton

¹With Site Specific Considerations and Valero Actual Costs

WGS – GHG, Energy, Water and other Environmental Impact Considerations

By requiring the installation of WGS on a FCCU, GHG emissions will increase as a result of the higher energy demand to operate a WGS. Thus, while the use of a WGS may result in a decrease in CCU criteria pollutants, facility wide GHG emissions and energy use will increase. In addition, there will be other environmental impacts from the construction and operation of a WGS.

1-7
cont.

1-8

1-9

1-10

In particular, the increased water use for a WGS must be carefully evaluated and considered. Also, the liquid purged from the WGS will need to be appropriately treated before discharging or reusing the liquid. This will result in the generation of additional waste water and solid waste (potentially hazardous waste) as well as potentially new wastewater treatment equipment. Also, the use of a WGS would likely result in a colder, saturated plume that would not disperse as effectively as exhaust going through the current CO Boiler stacks, thereby countering some of the benefits of reduced emissions to local receptors. These impacts must be considered when determining the overall benefit of the rule.

1-10
cont.

Catalyst Additives

In addition, the Project Scope notes that further study is needed to assess the use of a catalyst additive to reduce SO₂ emissions. Shell is not aware of any data that demonstrates that BARCT levels can be achieved through the use of catalyst additives. Shell agrees further study and testing is needed to properly assess the cost and benefits of using catalyst additive to reduce SO₂ emissions.

1-11

Summary

In summary, Shell has the following comments:

- **Additional PM Studies:** To develop an effective rule, additional studies are needed to accurately characterize any potential PM emission reductions.
- **Attainment:** Since the area is in attainment of SO₂ and non-attainment of PM standards, the cost-effectiveness should be based on PM emission reductions (which again cannot be accurately determined without further study).
- **Retrofit vs New/Modified:** The proposed SO₂ limits are based on BACT guidelines and NSPS, both of which are for newly constructed, reconstructed, and modified units. However, BARCT applies to the retrofit of existing units not being reconstructed or modified and so the proposed limits are not appropriate.
- **WGS Cost Effectiveness:** The actual costs for retrofitting an existing FCCU/CO Boiler with a WGS are significantly greater than estimated by BAAQMD.
- **Other Environmental Impacts:** WGS would result in higher energy consumption, greater GHG emissions, increase water usage, and greater liquid and solid waste generation.
- **Catalyst Additives:** Additional studies would be needed to determine the potential emission reductions and cost effectiveness of catalyst additives.

1-12

Shell is looking forward to continuing to work with BAAQMD staff to further discuss these concerns and determine a path forward.

Please contact Rick Shih at 925-313-0586 if you would like to discuss these issues in more detail.

Very truly yours,



Gordon Johnson
Manager, Environmental
Shell Oil Products, US – Martinez Refinery

Comment Letter No. 1

Gordon Johnson
Shell Oil Products, U.S. – Martinez Refinery

Response No. 1-1

Comment 1-1 is an introductory comment indicating that the letter provides comments on the Expedited Best Available Retrofit Control Technology (BARCT) Draft Environmental Impact Report (DEIR) and Staff Report.

The comment indicates that the comments provided by Shell on October 5, 2018 for the Initial Staff Report are still applicable to the Staff Report. The comment does not address any issue related to the DEIR and no response is required.

Response No. 1-2

Response 1-2 summarizes the conclusions in the DEIR with respect to water demand impacts, which reported that water demand impacts were potentially significant.

The comment further indicates that generating up to 300 gallons per minute of new wastewater would require upgrades to Shell's existing wastewater infrastructure and revisions to Shell's NPDES permit, and suggests that the EIR include a more complete analysis of water quality impacts or conclude that water quality impacts are potentially significant. Shell's comment incorrectly implies that the volume of the wastewater stream from a wet gas scrubber (WGS) would equal the volume of the water feed to the scrubber. To the contrary, by the nature of the process, only a fraction of the water used by a WSG is discharged as wastewater. This is because a large portion of the water demand is lost in the abatement process and through steam. Water used in the WGS is emitted in the form of steam from a stack that is saturated with water, forming a steam plume. The steam plume is the result of using water to reduce the particulate emissions in the WGS. Therefore, the wastewater generation would not equal the entire 300 gpm of water demand. For example, one wet ESP and WGS were installed on the FCCU at the Phillips 66 Los Angeles Refinery, and the environmental analysis for the project indicated that the expected wastewater discharge from the combined operation would be about 70 gallons per minute (100,800 gallons per day) as opposed to the system water demand of 300 gpm.¹ The current permitted wastewater discharge flow from the Martinez Refinery is about 10 million gallons per day with an average flow of 5.9 million gallons per day.² Therefore, the installation of a WGS would result in an increase in wastewater of about one percent of the maximum wastewater treatment capacity at the Shell Refinery (1.7 percent of the average flow), thus representing a relatively small increase in wastewater discharge from the Refinery.

¹ SCAQMD, 2007. Final EIR for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects, SCH No. 2006111138. Available at: <http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2007/feir-for-conocophillips-pm10-and-nox-reduction>

² San Francisco Bay Regional Water Quality Control Board, Tentative Order No. R2-2017-00XX, NPDES No. CA0005789. Available at: https://pubapps.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2017/October/shelloil/Tentative_Order.pdf

The potential increase in wastewater generation may require that facilities modify their National Pollution Prevention Discharge Elimination System (NPDES) permit, which varies from facility to facility. However, all facilities that would be affected by the expedited BARCT requirements operate under the requirements of an NPDES permit. As discussed in the DEIR (see Page 3.4-9), the NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities (including refineries) and wastewater treatment plants. For point sources (including refineries), the Regional Water Quality Control Boards prepare specific effluent limitations for constituents of concern and require monitoring of those constituents. Constituents of concern for the Shell Refinery include biochemical oxygen demand (BOD), total suspended solids, chemical oxygen demand (COD), oil and grease, total sulfides, phenolic compounds, chromium and hexavalent chromium, ammonia nitrogen, copper, cyanide, nickel, selenium, dioxin, and pH. By operating under the NPDES requirements, along with the enforcement of the permit as well as other existing regulations, the impacts on water quality associated with the installation of a WGS are expected to be less than significant.

Response No. 1-3 to 1-12

As stated in Response No. 1-1, Comment 1-1 indicates that the comments provided by Shell on October 5, 2018 for the Initial Staff Report are still applicable to the Staff Report. Comments 1-3 through 1-12 pertain to the Staff Report, and the comments do not address the DEIR and no response is required.

4.0 CHANGES TO THE DRAFT EIR

This section includes changes made to the DEIR due to recommended clarifications and other revisions. None of the modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5. Additions to the text of the Final EIR are denoted using underline. Text that has been eliminated is shown using ~~strike outs~~.

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

Table 3.2-29 has been revised and incorporated into the Final EIR to reflect corrections in the number of truck trips and corrections to transcription errors from the Draft EIR Appendix B. The table listed the number of one-way truck trips while the trip length reflected a round trip distance, resulting in the peak daily estimated emissions to be doubled. This has been changed by correcting the number of truck trips to reflect round trips rather than one-way trips for the peak-daily emissions calculations. Revisions are also being made to correct clerical errors that were made when transcribing the ROG, CO, PM₁₀, and PM_{2.5} emissions from the Draft EIR Appendix B to the summary tables. None of these modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5.

TABLE 3.2-29

Delivery Truck Emissions

Material	Truck Trips	Estimated Trip Length (mi)	Criteria Pollutant					
			ROG CO	CO ROG	NOx	SOx	PM ₁₀	PM _{2.5}
Operational Emissions Per Facility (lbs/day)								
Caustic/Catalyst for 3 WGS Units	3 6	120	<u>0.13</u> 0.24	<u>0.83</u> 1.65	<u>3.88</u> 7.77	<u>0.01</u> 0.03	<u>0.93</u> 0.18	<u>0.24</u> 0.06
Caustic/Catalyst for LoTox Scrubber	1 2	120	<u>0.04</u> 0.08	<u>0.28</u> 0.55	<u>1.29</u> 2.59	<u><0.01</u> 0.01	<u>0.31</u> 0.06	<u>0.08</u> 0.02
Lime for Cement Kiln	1 2	100	<u>0.04</u> 0.07	<u>0.23</u> 0.46	<u>1.08</u> 2.16	<u><0.01</u> 0.01	<u>0.26</u> 0.05	<u>0.07</u> 0.01
Total Peak Daily Emissions			<u>0.20</u> 0.39	<u>1.34</u> 2.66	<u>6.25</u> 12.52	<u>0.02</u> 0.05	<u>1.50</u> 0.29	<u>0.38</u> 0.09
Operational Emissions Per Facility (Tons/year)								
Caustic/Catalyst for 3 WGS	312	120	<u>0.01</u> 0.03	<u>0.04</u> 0.03	<u>0.20</u> 0.21	<u><0.01</u> 0.03	<u>0.05</u> 0.06	<u>0.01</u> 0.03
Caustic/Catalyst for LoTox Scrubber	104	120	<0.01	0.01	0.07	<0.01	0.02	<0.01

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Lime for Cement Kiln	365	100	0.01	0.04	0.20	<0.01	0.05	0.01
Total Annual Transport Emissions			<u>0.02</u> 0.05	<u>0.10</u> 0.08	<u>0.47</u> 0.48	<u><0.01</u> 0.05	<u>0.11</u> 0.13	<u>0.03</u> 0.05

Table 3.2-30 has been revised accordingly to reflect the revisions to the total emissions in Table 3.2-29. Additionally, a rounding error has been corrected under Annual Concurrent Operational Emissions for oxidizers, changing the total emissions from 19.5 tons/yr to 19.4 tons/yr. None of these modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5.

TABLE 3.2-30

Worst-Case Operational Emissions Under the AB 617 Expedited BARCT Implementation Schedule

ACTIVITY	ROG	CO	NO_x	SO_x	PM₁₀	PM_{2.5}
Daily Concurrent Operational Emissions (lb/day)						
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6
	<u>0.2</u>	<u>1.3</u>	<u>6.3</u>	<u><0.1</u>	<u>1.5</u>	<u>0.4</u>
Delivery Trucks for Caustic, Ammonia, and Lime	<u>2.7</u>	<u>0.4</u>	<u>12.5</u>	<u>0.1</u>	<u>0.3</u>	<u>0.1</u>
Total Concurrent Emissions	<u>2.6</u>	<u>107.9</u>	<u>19.4</u>	<u>0.2</u>	<u>4.1</u>	<u>3.0</u>
	<u>5.1</u>	<u>107.4</u>	<u>25.6</u>	<u>0.3</u>	<u>2.9</u>	<u>2.7</u>
Reductions from Project Implementation ⁽¹⁾	411	--	--	6,932	--	--
Net Concurrent Emissions⁽²⁾	<u>-408.4</u>	<u>107.9</u>	<u>19.4</u>	<u>-6931.3</u>	<u>4.1</u>	<u>3.0</u>
	<u>-405.9</u>	<u>107.4</u>	<u>25.6</u>	<u>-6,931.8</u>	<u>2.9</u>	<u>2.7</u>
Significance Thresholds	54	None	54	None	82	54
Significant?	No	--	No	--	No	No
Annual Concurrent Operational Emissions (tons/yr)						
15 Oxidizers	0.4	<u>19.4</u> <u>19.5</u>	2.4	<0.1	0.5	0.5
Delivery Trucks for Caustic, Ammonia, and Lime	≤0.1	0.1	0.5	≤0.1	0.1	≤0.1
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5
Reductions from Project Implementation	75.0	--	--	1,265.0	--	--
Net Concurrent Emissions⁽²⁾	<u>-74.5</u>	<u>19.5</u>	<u>2.9</u>	<u>-1,264.9</u>	<u>0.6</u>	<u>0.5</u>
Significance Thresholds	10	None	10	None	15	10
Significant?	No	--	No	--	No	No

(1) See Table 3.2-10. Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

Appendix B:

Appendix B has been revised to reflect the changes in Tables 3.2-29 and 3.2-30. The tables on page B-16 have been revised to better clarify the truck trip emission calculations. The summary table on page B-2 has been revised to reflect the changes in Tables 3.2-30. None of these modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5.

Appendix B
Expedited BARCT Implementation Schedule
Operational Delivery Truck Emissions

Equipment	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PMI (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Caustic/Catalyst for 1 LoTox Scrubber	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Lime for Cement Klin	HHDT	100	365	36500	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	12.860	84.246	393.357	1.279	94.212	24.101	62.008
Annual Emissions (tons/yr)																		
Peak Daily (lb/day)																		

Notes:

- Peak day assumes 3 caustic delivery trucks for WGS, 1 caustic delivery truck for LoTox, and 1 lime delivery truck.
- Enfrac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.
- Fugitive PM emission calculations for travel on paved roads from EPA AP-42, Section 13.2.1, January 2011
 $E = k(sL)^{0.91} \times (W)^{0.72}$
 Where: $k = 0.0022$ lb/VMT for PM10, $sL =$ road silt loading (gms/m²)
 (0.03 for major/collector roads), $W =$ weight of vehicles (2.5 tons for light, 5.5 for medium trucks, and 24 for heavy trucks)
- Carbon Dioxide Equivalence (CO_{2e}) = CO₂ + CH₄ * 21 + N₂O*310
 where CO₂ emissions factors are from Enfrac2011. CH₄ and N₂O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA, 2008.
 where light vehicle are gasoline light duty trucks.
 where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019		
	Light	Medium	Heavy
CO ₂ (lb/mi)	0.8949	2.2430	3.7418
CH ₄ (g/mi)	0.0148	0.0051	0.0051
N ₂ O (g/mi)	0.0157	0.0048	0.0048
CO _{2e} (lb/mi)	0.906	2.247	3.745

	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Daily Peak Emissions (lbs/day)	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Caustic/Catalyst for 1 WGS	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Caustic/Catalyst for 1 LoTox Scrubber	0.07	0.46	2.16	0.01	0.05	0.01	749.05

	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Annual Emissions (tons/yr)	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Caustic/Catalyst for 1 WGS	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Caustic/Catalyst for 1 LoTox Scrubber	0.01	0.04	0.20	0.00	0.05	0.01	0.03

AB 617 Expedited BARCT Implementation Schedule

Appendix B

**Appendix B
Expedited BARCT Implementation Schedule
Operational Emissions Summary**

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Daily Concurrent Operational Emissions (lb/day)							
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6	18.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	1.2
Delivery Trucks for Caustic, Ammonia, and Lime	2.7	0.4	12.5	0.1	0.3	0.1	0.7
Total Concurrent Emissions	5.1	107.4	25.6	0.3	2.9	2.7	20.6
Reductions from Project Implementation ⁽¹⁾	411.0	--	--	6932	--	--	--
Net Concurrent Emissions ⁽²⁾	-405.9	107.4	25.6	-6931.8	2.9	2.7	20.6
Significance Thresholds	54	None	54	None	82	54	None
Significant?	No	--	No	--	No	No	--
Annual Concurrent Operational Emissions (tons/yr)							
15 Oxidizers	0.4	19.5	2.4	0.1	0.5	0.5	6825.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	451.9
Delivery Trucks for Caustic, Ammonia, and Lime	0.1	0.1	0.5	0.1	0.1	0.1	111.2
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5	7388.8
Reductions from Project Implementation	75.0	0.0	0.0	1265.0	0.0	0.0	0.0
Net Concurrent Emissions ⁽²⁾	-74.5	19.5	2.9	-1264.9	0.6	0.5	7388.8
Significance Thresholds	10	None	10	None	15	10	10000
Significant?	No	--	No	--	No	No	No

Note:

(1) Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

Appendix B
Expedited BARCT Implementation Schedule
Operational Delivery Truck Emissions

Equipment	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PMI (lb/mi)	Fugitive PMI (lb/mi)	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 3 WGS	HHDT	120	312	37440	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	13.191	86.415	403.487	1.311	96.639	24.722	63.605
Caustic/Catalyst for LoTox Scrubber	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Lime for Cement Kiln	HHDT	100	365	36500	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	12.860	84.246	393.357	1.278	94.212	24.101	62.008
Annual Emissions (tons/yr)																		
Peak Daily (lb/day)												0.20	1.34	6.25	0.02	1.50	0.38	0.99

Notes:
 (1) Peak day assumes 3 caustic, 1 ammonia, and 1 lime delivery truck.
 (2) Enfrac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.
 (3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011
 $E = k(sL)^{0.94} \times (W)^{0.92}$
 where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m²)
 (0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light, 5.5 for medium trucks, and 24 for heavy trucks)
 (4) Carbon Dioxide Equivalence (CO_{2e}) = CO₂ + CH₄ * 21 + N₂O*310
 where CO₂ emissions factors are from Enfrac2011. CH₄ and N₂O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA, 2008.
 where light vehicle are gasoline light duty trucks.
 where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019	
	Light	Heavy
CO ₂ (lb/mi)	0.8848	3.7418
CH ₄ (g/mi)	0.0148	0.0051
N ₂ O (g/mi)	0.0157	0.0048
CO _{2e} (lb/mi)	0.906	2.247

Single Trip Emissions (lbs/day)	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Caustic/Catalyst for 3 WGS	0.13	0.83	3.88	0.01	0.93	0.24	0.61
Caustic/Catalyst for LoTox Scrubber	0.04	0.28	1.28	0.00	0.31	0.08	0.20
Lime for Cement Kiln	0.04	0.23	1.08	0.00	0.26	0.07	0.17
Total Peak Daily Emissions	0.20	1.34	6.25	0.02	1.50	0.38	0.99

Total Annual Emissions (tons/yr)	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Caustic/Catalyst for 3 WGS	0.01	0.04	0.20	0.00	0.05	0.01	63.60
Caustic/Catalyst for LoTox Scrubber	0.00	0.01	0.07	0.00	0.02	0.00	21.20
Lime for Cement Kiln	0.01	0.04	0.20	0.00	0.05	0.01	62.01
Total Annual Emissions	0.02	0.10	0.47	0.00	0.11	0.03	146.81

AB 617 Expedited BARCT Implementation Schedule

Appendix B Expedited BARCT Implementation Schedule Operational Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Daily Concurrent Operational Emissions (lb/day)							
15 Oxidizers	2.4	106.6	13.1	0.2	2.6	2.6	18.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	1.2
Delivery Trucks for Caustic, Ammonia, and Lime	0.2	1.3	6.3	0.0	1.5	0.4	1.0
Total Concurrent Emissions	2.6	107.9	19.4	0.2	4.1	3.0	20.9
Reductions from Project Implementation ⁽¹⁾	411.0	--	--	6931.5	--	--	--
Net Concurrent Emissions ⁽²⁾	-408.4	107.9	19.4	-6931.3	4.1	3.0	20.9
Significance Thresholds	54	None	54	None	82	54	None
Significant?	No	--	No	--	No	No	--
Annual Concurrent Operational Emissions (tons/yr)							
15 Oxidizers	0.4	19.4	2.4	0.0	0.5	0.5	6825.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	451.9
Delivery Trucks for Caustic, Ammonia, and Lime	0.0	0.1	0.5	0.0	0.1	0.0	146.8
Total Concurrent Emissions	0.5	19.5	2.9	0.0	0.6	0.5	7424.4
Reductions from Project Implementation	75.0	0.0	0.0	1265.0	0.0	0.0	0.0
Net Concurrent Emissions ⁽²⁾	-74.5	19.5	2.9	-1265.0	0.6	0.5	7424.4
Significance Thresholds	10	None	10	None	15	10	10000
Significant?	No	--	No	--	No	No	No

Note:

(1) Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

**Notice of Public Hearing
and California Environmental Quality Act
Notice of Availability of a Draft Environmental Impact Report
for**

AB 617 Expedited Best Available Retrofit Control Technology Implementation Schedule

TO: Interested Parties

FROM: Bay Area Air Quality
Management District
375 Beale St., Suite 600
San Francisco, CA 94105

Lead Agency: Bay Area Air Quality Management District
Contact: David Joe, Principal Air Quality Engineer Phone: (415) 749-8623

**SUBJECT: NOTICE OF PUBLIC HEARING AND CEQA NOTICE OF AVAILABILITY OF A
DRAFT ENVIRONMENTAL IMPACT REPORT**

Notice is hereby given pursuant to California Public Resource Code, Sections 15206 and 15087 (c) that the Bay Area Air Quality Management District ("Air District") has prepared a Draft Environmental Impact Report (EIR) for the Assembly Bill 617 (AB 617) Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule in accordance with California Environmental Quality Act (CEQA) requirements. Notice is also given that the Board of Directors of the Bay Area Air Quality Management District will conduct a public hearing on December 19, 2018, at the Air District Headquarters' Board Room, 375 Beale Street, San Francisco, California, at 9:45 a.m., or as soon thereafter as the matter may be heard, to consider adoption of the AB 617 Expedited BARCT Implementation Schedule and certification of a final Environmental Impact Report.

Project Title: Assembly Bill 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule

State Clearinghouse Number: 2018082003

Project Location: The proposed Expedited BARCT Implementation Schedule applies within the Bay Area Air Quality Management District ("District"), 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: Assembly Bill 617, approved July 26, 2017, amends California Health and Safety Code section 40920.6 et seq. and requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) on specified facilities by the earliest feasible date, but no later than December 31, 2023. Local air districts are required to adopt this schedule before January 1, 2019. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. The overall purpose of BARCT implementation is to reduce criteria pollutant emissions from significant industrial sources that currently participate in the GHG Cap-and-Trade system.

The Expedited BARCT Implementation Schedule includes six potential rule development projects to address emissions from: 1) organic liquid storage tanks; 2) petroleum wastewater treating; 3) Portland cement manufacturing; 4) refinery fluid catalytic crackers and CO gas boilers; 5) refinery heavy liquid leaks; and 6) petroleum coke calcining.

Significant Impacts: The draft EIR for the Expedited BARCT Implementation Schedule concluded that air quality impacts associated with the construction of air pollution control equipment would be potentially significant after mitigation and cumulatively considerable. Water demand impacts from the operation of air pollution control equipment were found to be potentially significant after mitigation and cumulatively considerable. Mitigation measures are required for air quality impacts from construction activities and water demand impacts from operation of air pollution control equipment.

The proposed AB 617 Expedited BARCT Implementation Schedule staff report and draft EIR are available

at the Air District headquarters, on the website at <http://www.baaqmd.gov/ab617barct>, or by request. Requests for copies of the staff report or draft EIR should be directed to Karen Fremming (kfremming@baaqmd.gov) at (415) 749-8427.

Comments relating to the proposed schedule and environmental analysis should be addressed to David Joe, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to djoe@baaqmd.gov. Comments on the proposed Expedited BARCT Implementation Schedule and draft EIR will be accepted from October 23, 2018 until December 7, 2018 at 5:00 p.m.

Jack P. Broadbent
Executive Officer
Bay Area Air Quality Management District

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

AB 617 Expedited BARCT Implementation Schedule Project

Prepared for:

Bay Area Air Quality Management District
375 Beale St., Suite 600
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Contact: David Joe
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October 2018

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AB 617 Expedited BARCT Implementation Schedule Project**

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CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

Introduction

Areas of Potential Controversy

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

Executive Summary: Chapter 4 – Alternatives Analysis

Executive Summary: Chapter 5 - References

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District), in accordance with Assembly Bill 617, (AB 617) is proposing to implement the Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule (project or proposed project). AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of BARCT by the earliest feasible date but no later than 2023. This requirement applies to industrial sources subject to California's Greenhouse Gas (GHG) Cap-and-Trade requirements.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution. The goal of AB 617 is to reduce communities' burden from air pollution and the Expedited BARCT Implementation Schedule is part of that process.

1.2 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 Air District has prepared this Environmental Impact Report (EIR) under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the Expedited BARCT Implementation Schedule. Prior to making a decision on the adoption of the proposed project, the Air District Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed Expedited BARCT Implementation Schedule.

1.2.1 NOTICE OF PREPARATION/INITIAL STUDY

A Notice of Preparation for the Draft EIR for the Expedited BARCT Implementation Schedule was distributed to responsible agencies and interested parties for a 30-day review on August 7, 2018. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the Air District's web site. A public scoping meeting was held at the District headquarters on August 24, 2018. Two public comment letters were submitted on the NOP to the Air District and are included in Appendix A of this EIR.

The NOP/IS identified impacts on the following environmental resources as being potentially significant, requiring further analysis in the EIR: air quality, hazards and hazardous materials, hydrology and water quality, and utilities and service systems. Impacts on 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, greenhouse gas emissions, land use/planning, mineral resources, noise, population/housing, public services, recreation, transportation/traffic, and tribal cultural resources (see Appendix A). Water demand impacts were considered to be potentially significant in both the hydrology and water quality section, and the utilities and service systems portion of the Initial Study. In the EIR, the discussion of water demand impacts was consolidated into the hydrology and water quality section.

1.2.2 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 effect 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 the Expedited BARCT Implementation Schedule 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). The Expedited BARCT Implementation Schedule would apply to industrial sources including petroleum refineries, facilities with storage tanks, cement kilns, and petroleum coke calciners.

1.2.3 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 Air District’s Board of Directors and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the Air District’s Board to facilitate decision making on the proposed project.

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

1. A list of the agencies that are expected to use the 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.

There are no federal, state, or local permits required to adopt the Expedited BARCT Implementation Schedule. Local public agencies, such as cities, and counties could be expected to utilize this EIR if local approval is required for facility modifications due to the implementation of BARCT (e.g., new air pollution control equipment) at affected industrial sources, pursuant to CEQA Guidelines §15152. However, implementation of the proposed project is limited to implementation of air pollution control equipment and measures.

1.2.4 AREAS OF POTENTIAL CONTROVERSY

In accordance with 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. As noted above, two comment letters were received on the NOP/IS. Issues and concerns raised in the comment letters included: (1) potential impacts associated with the installation of geodesic domes on storage tanks; and (2) a recommendation that lead agencies consult with all California Native American tribes. The impacts on aesthetics associated with domes on storage tanks were addressed in the NOP/IS (see Appendix A). The NOP/IS concluded that BARCT measures would include the installation of equipment, including domes, that may be visible outside of the existing industrial facilities; however, these facilities are located in industrial areas which do not have scenic views or scenic resources. Storage tanks are generally located at refineries, bulk handling and storage facilities, or manufacturing facilities that are located in industrial areas. Because of the location, domes on storage tanks are not expected to have significant adverse aesthetic impacts to the surrounding communities. Regarding tribal resources, construction activities are limited to industrial facilities and all construction activities would take place at existing facilities that have been previously graded, such that proposed BARCT requirements are not expected to affect tribal resources. Nonetheless, individual projects will need to be examined on a project-specific basis, when the precise location and compliance methods are known, and additional consultation with tribes may be required.

1.3 EXECUTIVE SUMMARY: CHAPTER 2 – PROJECT DESCRIPTION

The Expedited BARCT Implementation Schedule strategy will consist of the implementation of several rule development projects in order to fulfill the requirements of AB 617. The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), SO₂, NO₂, and lead. The air basin is designated as nonattainment for ozone (O₃) and particulate matter (PM_{2.5} and PM₁₀) California ambient air standards, therefore the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NO_x)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM₁₀)

- Particulate Matter less than 2.5 microns (PM_{2.5})
- Sulfur Dioxide (SO₂)

NO_x and ROG are included because they are precursors for ozone formation. SO₂ may contribute to formation of condensable PM (i.e. formed in the emissions plume from the stack), so PM control strategies may include SO₂ limits.

A list of facilities, sources, and emissions were developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. This list of facilities was reduced to 19 “industrial” facilities, which includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation (17 CCR § 95890(a)). These 19 industrial Cap-and-Trade facilities encompass 1,899 individual sources in 50 source categories. These sources were reviewed for the amount of emissions and existing controls that may already comply with BARCT. After screening for these sources with emissions greater than 10 pounds per day and sources that have not already achieved BARCT, the population of sources was reduced to the following:

- NO_x: 21 source categories, 73 sources representing 30% of the emissions (1,764 tpy)
- ROG: 23 source categories, 259 sources representing 93% of the emissions (2,430 tpy)
- PM: 16 source categories, 124 sources representing 92% of the emissions (1,851 tpy)
- SO₂: 15 source categories, 102 sources representing 71% of the emissions (3,651 tpy)

The BAAQMD reviewed available information on current achievable emission limits and potential controls for each source category and pollutant. Six potential rule development projects have been identified for inclusion in the Expedited BARCT Implementation Schedule to address the following:

- Reduce ROG emissions from Organic Liquid Storage Tanks;
- Reduce ROG emissions associated with Refinery Wastewater Treatment Systems;
- Reduce PM and SO₂ emissions from Portland cement manufacturing;
- Reduce PM and SO₂ emissions from Refinery Fluid Catalytic Cracking Units and CO Gas Boilers;
- Reduce ROG emissions from Fugitive Heavy Liquid Leaks; and
- Reduce NO_x emissions from Petroleum Coke Calcining Operations.

1.3.1 PROJECT OBJECTIVES

The objectives of the Expedited BARCT Implementation Schedule are to:

- Implement and/or install best available retrofit control technologies on industrial sources subject to CARB’s Cap-and-Trade program, as defined by the AB 617 requirements;

- Reduce criteria pollutant emissions from significant industrial sources that participate in CARB's Cap-and-Trade program;
- Lessen the burden of air quality impacts on communities that suffer a disproportionate burden from air pollution; and
- Comply with the requirements AB 617.

1.3.2 SOURCES AFFECTED BY EXPEDITED BARCT IMPLEMENTATION

The overall purpose of the Expedited BARCT Implementation Schedule is to reduce criteria pollutant emissions from significant sources that currently participate in CARB's GHG Cap-And-Trade program. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities. The proposed project would apply to refineries, petroleum coke calcining facilities, and cement kilns.

1.3.3 BARCT EMISSION CONTROL TECHNOLOGIES

To comply with the BARCT requirements for affected facilities, operators could reduce operations or implement BARCT, which includes different types of air pollution control equipment or measures. The type of emission capture and control technology that may be used depends on the specific type of pollutant to be controlled. The air pollution control measures that are likely to be encountered as a result of the proposed BARCT requirements are categorized into the following groups:

- Installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit;
- Covering lift stations, manholes, junction boxes, conveyances and other wastewater facilities at refineries and venting ROG emissions to a vapor combustor;
- Requiring additional lime injection on cement kilns to control SO₂ in order to reduce condensable PM emissions;
- Controlling PM emissions from FCCUs using SO₂ reducing catalyst additives, additional ESP capacity, or wet gas scrubbers;
- Reducing ROG emissions from fugitive components in heavy liquid service at refineries through increased LDAR programs;
- Reducing NO_x emissions from coke calcining facilities through the use of SCR units and/or LoTO_x system with a wet scrubber.

1.4 EXECUTIVE SUMMARY: CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Chapter 3 of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the Expedited BARCT Implementation Schedule and

recommends mitigation measures (when significant environmental impacts have been identified). Chapter 3 provides this analysis for each of the environmental areas identified in the Initial Study (see Appendix A), including: (1) Air Quality; (2) Hazards and Hazardous Materials; (3) Hydrology and Water Quality, and (4) Utilities and Service Systems. Included for each impact category is a discussion of the environmental setting, significance criteria, whether the proposed project will result in any significant impacts (either individually or cumulatively in conjunction with other projects), and feasible project-specific mitigation (if necessary and available). Note that water demand impact was found to be potentially significant under both Hydrology and Water Quality, and Utilities and Service Systems in the NOP/IS. In the EIR, the discussion of water demand impacts has been consolidated into the Hydrology and Water Quality resource section.

1.4.1 AIR QUALITY

1.4.1.1 Air Quality Setting

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards (AAQS) 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 (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The Air District is in attainment of the State AAQS for CO, NO₂, and SO₂. However, the Air District does not comply with the State 24-hour PM₁₀ standard, annual PM₁₀ standard, and annual PM_{2.5} standard. The Air District is unclassifiable/attainment for the federal CO, NO₂, SO₂, lead, and PM₁₀ standards. A designation of unclassifiable/attainment means that the U.S. EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

The 2017 air quality data from Air District monitoring stations show that no monitoring stations measured an exceedance of any State or federal AAQS for CO and SO₂. There was one exceedance of the federal NO₂ AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM₁₀ standards. The State 24-hour PM₁₀ standard was exceeded on six days in 2017, at the San Jose monitoring station.

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour PM_{2.5} standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley. The federal 24-hour PM_{2.5} standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

1.4.1.2 Air Quality Impacts

The Expedited BARCT implementation Schedule consists of six individual rule development projects that aim to control a variety of TACs and criteria pollutants in order to achieve the goals of AB 617. The Expedited BARCT Implementation Schedule is expected to result in a substantial reduction in criteria pollutant emissions, including approximately 75-125 tons per year of ROG emissions and 1,265 tons per year of SO_x emissions. Additional criteria pollutant emission reductions are expected due to implementation of the Expedited BARCT Implementation Schedule and related control measures. However, the magnitude of the emissions reductions associated with some of the control measures is currently unknown.

Implementation of some of the control measures in the Expedited BARCT Implementation Schedule could involve retrofitting and replacing air pollution control equipment, which has the potential to create air quality impacts. Emissions from one pollutant may increase slightly in order to effectively reduce overall emissions.

Increases in criteria pollutant emissions could also occur as a consequence of efforts to improve air quality. Implementation of the Expedited BARCT Implementation Schedule would result in air emission increases associated with: (1) construction activities (e.g., to install air pollution control equipment); (2) air pollution control technologies that generates air emissions (e.g., oxidizers); and (3) transportation of materials (caustic, ammonia, and lime). As shown in Chapter 3.2, construction activities could generate ROG, NO_x, PM₁₀, and PM_{2.5} emissions that exceed the Air District's construction significance threshold. Therefore, construction air quality impacts are concluded to be significant, as well as cumulatively considerable. The impacts from operation of air pollution control equipment and methodologies to control criteria pollutant emissions under the Expedited BARCT Implementation Schedule are expected to be less than significant for all criteria pollutant emissions. Additionally, the project is expected to have quantifiable emissions benefits for both ROG and SO_x emissions. For the remaining pollutants, the project is expected to provide emissions benefits, but because the benefits are not readily quantifiable, they have not been included in Chapter 3.2.

In general, it should be noted that while there are secondary TAC emissions increases associated with the operation of new air pollution control equipment (e.g., ammonia and caustic), a reduction in TAC emissions would also be expected. It is not possible to estimate those emission reductions at this point until the sources that will be controlled are more defined and the appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control ROG emissions as a result of the proposed project (e.g., domes/vapor control on storage tanks) is expected to result in a reduction in TAC emissions from affected facilities.

1.4.2 HAZARDS AND HAZARDOUS MATERIALS

1.4.2.1 Hazards and Hazardous Materials Setting

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials

as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions and include: (1) toxic gas clouds due to releases of volatile chemicals; (2) fires or explosions; (3) thermal radiation from the heat generated by a fire; and (4) explosion and overpressure when vessels containing flammable explosive vapors and potential ignition sources are combined.

In 2017, there were a total of 1,634 incidents reported in the nine counties regulated by the Air District, with the most incidents (388) reported in Alameda County, followed by Contra Costa County (313). Hazardous materials incidents during transportation, residential areas, and at waterways were the most common locations, respectively, for hazardous materials incidents. About 19 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas the most common (38 percent), followed by waterways (28 percent).

1.4.2.2 Hazards and Hazardous Materials Impacts

The Expedited BARCT Implementation Schedule would require facilities and refineries to install new or modify their existing air pollution control equipment or implement control measures. Additional hazard and hazardous material impacts are expected to result from the operation of several of the possible control technologies that would most likely be used. Facility modifications associated with the proposed project are expected to include additional lime injection at cement plants, increased LDAR in heavy liquid service at refineries, thermal incinerators, vapor combustors, vapor recovery units, the installation of SCRs, wet gas scrubbers, electrostatic precipitators, and/or LoTOx™ injection.

As discussed in Chapter 3.3.4, the increased use of hazardous materials including lime, caustic, and ammonia were determined to result in less than significant impacts for the increase in materials, as well as the related transportation hazards. The hazard impacts associated with the installation and operation of air pollution control equipment under the Expedited BARCT Implementation Schedule are expected to be less than significant.

1.4.3 HYDROLOGY AND WATER QUALITY

1.4.3.1 Hydrology and Water Quality Setting

The District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from

southern Santa Clara County to Tomales Bay in Marine County; and inland to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: Creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

Local water supplies account for about 31 percent of the total, and the remaining water supply is imported from the State Water Project (SWP) (13 percent), Central Valley Project (CVP) (15 percent), the Mokelumne watershed (19 percent), and the Tuolumne watersheds (19 percent). Some Bay Area water agencies are projecting future water supply shortfalls in dry years (including Alameda County Water District -2020, Santa Clara Valley Water District – 2040, and Sonoma County Water Agency – 2025), and some are already seeing such shortfalls (including East Bay Municipal Utility District, City of Napa Water Department, and Solano County Water Agency). Other agencies anticipate being able to handle a single dry year, largely because of reservoirs, or other storage capacity, including Contra Costa Water District, Marin Municipal Water District, San Francisco Public Utilities Commission, and Zone 7 Water Agency. The severity and timing of dry year shortfalls differ greatly among the agencies because of the wide variation of supply sources, types of use, and climates within the region. Shortages in precipitation in the Sierra Nevada can have a pronounced effect on water supply in the region than a drought in the Bay Area itself because of the reliance of the region on water from the Tuolumne and Mokelumne watersheds.

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. Some treatment plants serve individual cities while others serve multiple jurisdictions. More than 50 agencies provide wastewater treatment throughout the Bay Area. Each plant is typically sized to accommodate growth over a 15- to 20-year period. In addition, a number of industrial facilities also have wastewater treatment facilities, e.g., refineries.

1.4.3.2 Hydrology and Water Quality Impacts

It is expected that affected industrial facilities would install new or modify existing air pollution control equipment to comply with the Expedited BARCT Implementation Schedule. Most air pollution control equipment does not use water or generate wastewater. However, additional water demand and wastewater generation impacts are expected to result from the operation of wet gas scrubbers and/or wet ESPs, which may be used to control refinery FCCUs and coke calciners, and water to make the lime slurry to control emissions from the cement kiln.

Water demand impacts from installing up to three WGS systems on refinery FCCUs, additional lime injection on a cement kiln, and a LoTOX on a coke calciner may exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant, as well as cumulatively considerable. Mitigation measures were imposed that required the use of recycled water, if available, and a written declaration from the local water purveyor, if recycled water cannot be supplied to the applicable air pollution control equipment. In spite of implementing the identified mitigation measures, 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 facilities and because of the prevalence of drought conditions in California. Therefore, impact of the proposed project will remain significant, as well as cumulatively considerable, after mitigation for water demand.

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.

1.5 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 4 of this EIR, the proposed project could result in potentially significant impacts to: (1) air quality during construction; and (2) water demand associated with operation of additional air pollution control equipment. 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)).

Under Alternative 1, the No Project Alternative, no additional air pollution control equipment or measures (e.g., monitoring/repair of fugitive heavy liquid leaks) would be implemented. Alternative 1 would not comply with AB 617, which requires air districts to review the emissions control technology installed on pollution sources located at industrial facilities subject to the Cap-and-Trade program and implement BARCT at affected facilities. Alternative 1 would not comply with the AB 617 requirements and would not be considered feasible at this time. It should be noted that it would be unlikely that the District would remain out of compliance with AB 617 indefinitely and some action would likely be taken in the future to comply. Nonetheless,

for the purpose of comparison and public disclosure, it will be assumed that no action will be taken under the No Project Alternative.

Alternative 2 would delay the Expedited BARCT Implementation Schedule so that all rules would not be implemented until 2023, which is the deadline for implementing BARCT air pollution control measures required under AB 617. Therefore, the overlap of construction activities would be expected to be reduced; however, there will be a loss of operational emissions benefits (emissions reductions) for several years as compared to the proposed project.

Alternative 1 would eliminate the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} impacts associated with construction activities to less than significant, but would not achieve any of the proposed project objectives. Alternative 2 would reduce the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} impacts associated with construction activities, but not to less than significant levels, and the water demand impact would be the same as the proposed project; however, Alternative 2 would achieve all of the project objectives. Since Alternative 2 would reduce the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} impacts and achieve the project objectives, Alternative 2 would be considered the environmentally superior alternative.

The proposed project would be considered the preferred alternative as it would achieve all of the project objectives and emission reductions associated with the implementation of BARCT on the affected facilities and the emission reductions would be expected to occur two years earlier than under Alternative 2, providing an additional two years-worth of emissions benefits.

1.6 EXECUTIVE SUMMARY: CHAPTER 5

Chapter 5 provides the references used in the preparation of the EIR.

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

Impact	Mitigation Measures	Residual Impacts
Air Quality		
<p>The construction activities required as a result of the Expedited BARCT Implementation Schedule may result in ROG, NO_x, PM₁₀, and PM_{2.5} emissions that would exceed the significance thresholds resulting in potentially significant air quality impacts.</p>	<p>Minimize emissions from vehicles and trucks; limit truck idling; maintain construction equipment to manufacturer's recommendations; identify construction areas served by electricity; use cranes rated 200 hp or greater with Tier 4 engines or equivalent (if available); and use off-road equipment rated 50 to 200 hp with Tier 4 or equivalent engines (if available).</p>	<p>ROG, NO_x, PM₁₀, and PM_{2.5} emission impacts during construction activities are potentially significant under the Expedited BARCT Implementation Schedule following mitigation, but are short-term and would cease when construction activities are complete.</p>
<p>Operational activities that may be required as a result of the Expedited BARCT implementation Schedule are expected to result in emissions of ROG, CO, NO_x, SO_x, PM₁₀, and PM_{2.5} that would result in less than significant impacts. In addition the project would result in substantial reductions in ROG (75-125 tons/yr) and SO_x (1,265 tons/yr). Additional emission reductions are expected but the magnitude of the reductions is currently unknown.</p>	<p>None required.</p>	<p>Operational emissions of ROG, CO, NO_x, SO_x, PM₁₀, and PM_{2.5} would result in less than significant impacts.</p>
<p>Potential TAC emissions increases associated with implementation of the Expedited BARCT implementation Schedule are expected to result in less than significant impacts. Additional TAC emission reductions are expected but the magnitude of the reductions is currently unknown.</p>	<p>None required.</p>	<p>Impacts from potential TAC emissions under the Expedited BARCT Implementation Schedule would be less than significant.</p>

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Hazards and Hazardous Materials		
Hazard impacts from air pollution control equipment, including fire or explosion impacts from the use of dry ESPs, are expected to be less than significant under the Expedited BARCT implementation Schedule.	None required.	Hazard impacts associated with the use of air pollution control equipment would remain less than significant.
Transportation and use of hazardous materials in WGSs, lime injection systems, and SCRs are expected to result in less than significant impacts under the Expedited BARCT Implementation Schedule	None required.	Impacts from transportation and use of hazardous materials would remain less than significant.
Hydrology and Water Quality		
The potential water demand associated with air pollution control equipment, particularly refinery wet gas scrubbers/ESPs, lime injection, and LoTOx, could result in a significant impact on water demand associated with the Expedited BARCT Implementation Schedule.	Mitigation measures include the requirement to use reclaimed or recycled water, if available.	Water demand impacts are expected to remain significant as the use of reclaimed or recycled water cannot be assured.
Wastewater generated from the installation of air pollution control equipment to comply with the Expedited BARCT Implementation Schedule is not expected to exceed any applicable water quality significance thresholds. Therefore, no wastewater impacts are expected.	None required.	Wastewater impacts are expected to remain less than significant.

CHAPTER 2

PROJECT DESCRIPTION

Introduction
Project Location
Project Objectives
Background and Project Description

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2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

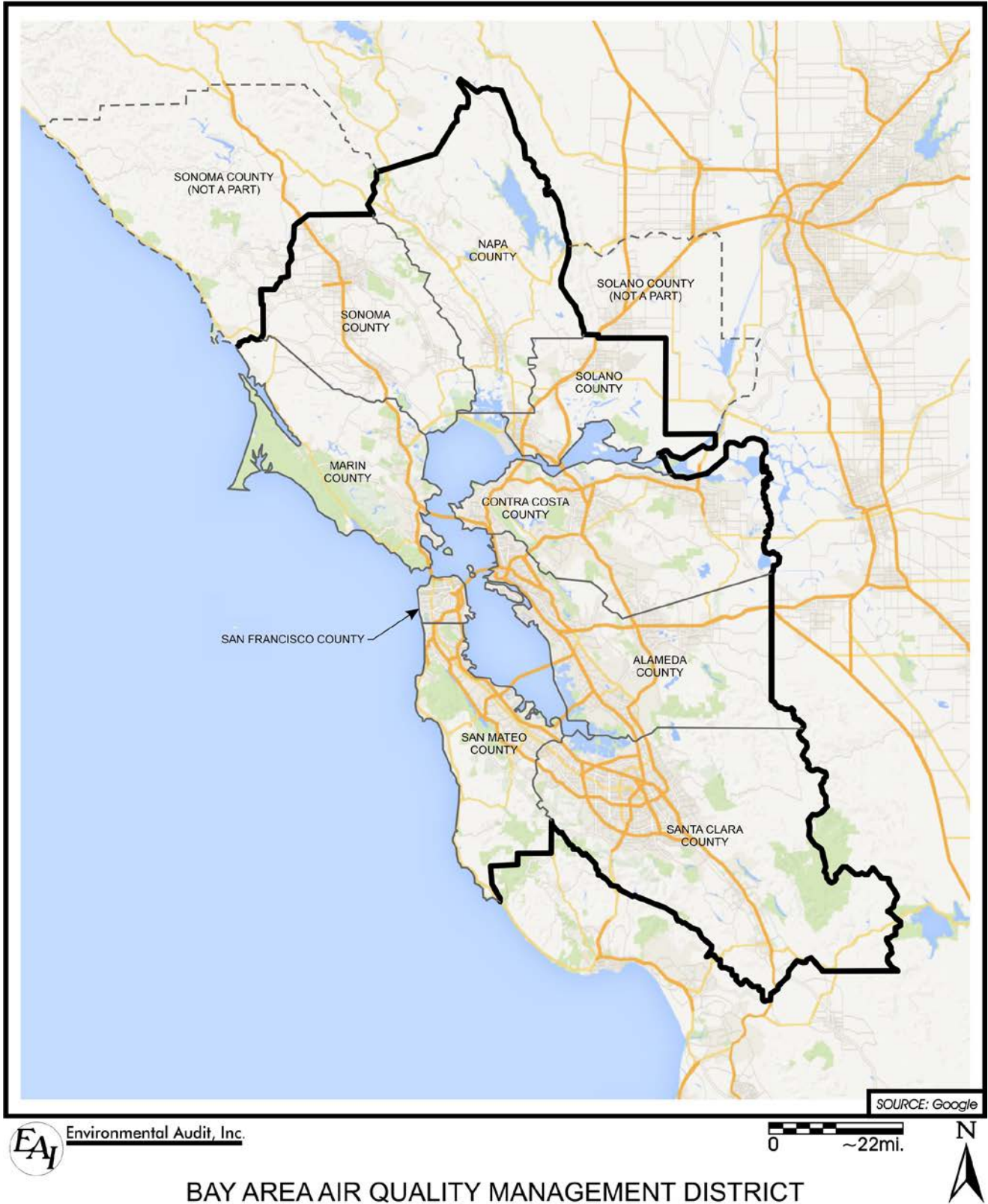
The Bay Area Air Quality Management District (District), in accordance with Assembly Bill 617, (AB 617) is preparing the best available retrofit control technology (BARCT) implementation schedule project (project or proposed project). AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date. This requirement applies to each industrial source subject to California Air Resources Board's (CARB's) Greenhouse Gas (GHG) Cap-and-Trade requirements.


The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in CARB's GHG Cap-and-Trade program. The Cap-and-Trade program is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution.

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).

AB617 Expedited BARCT Implementation Schedule



 Environmental Audit, Inc.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

2.3 PROJECT OBJECTIVES

The objectives of the Expedited BARCT Implementation Schedule are to:

- Implement and/or install best available retrofit control technologies;
- Reduce criteria pollutant emissions from significant industrial sources that participate in Cap and Trade; and
- Lessen the burden of air quality impacts on communities that suffer a disproportionate burden from air pollution.

2.4 BACKGROUND AND PROJECT DESCRIPTION

2.4.1 BACKGROUND

With the adoption of AB 617, the state acknowledges that many communities around the state continue to experience disproportionate impacts from air pollution. To address these impacts, AB 617 directs all air districts that are in nonattainment areas to apply BARCT to all industrial sources subject to Cap-and-Trade, and to identify communities with a “high cumulative exposure burden” to air pollution. Districts must then prioritize these communities for the development of community air monitoring projects and/or emission reduction programs. The State requires that monitoring campaigns and emission reduction programs be developed through a community-based process.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. The Cap-and-Trade program includes particular provisions for “industrial” facilities, which are covered entities or facilities that are eligible for free allowance allocation. Under the Cap-and-Trade program, these free allocations are provided to certain industrial sectors to minimize potential leakage of economic activity and GHG emissions. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution.

The proposed project aims to implement rule development projects that will require the use of BARCT for specific equipment in industrial facilities that are subject to GHG Cap-and-Trade requirements in order to reduce criteria pollutant emissions. A summary of the AB617 requirements is outlined below.

- Air districts in nonattainment areas must implement BARCT on all industrial sources subject to the AB 32 Cap-and-Trade Program.

- The California Air Resources Board (CARB) must establish and maintain a clearinghouse of best available control technology (BACT), and BARCT.
- Air pollution violation maximum penalties were increased, and will adjust with inflation.
- CARB must prepare an air monitoring plan for all areas of the state by October 1, 2018.
- Based on air monitoring plan information, CARB must select communities with high cumulative exposure burden to both toxic and criterial air pollutants by July 1, 2019.
 - Each air district with a high cumulative burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
- By January 1, 2020, and each January 1 thereafter, CARB will select additional communities with high cumulative exposure burden.
 - Each air district with a high burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
- CARB must prepare a state-wide strategy to reduce emissions of toxic and criteria pollutants in communities affected by high cumulative exposure burden, by October 1, 2018, and update the strategy every five years. Criteria for the state-wide strategy include:
 - Disadvantaged communities and sensitive receptor locations are a priority.
 - A methodology for assessing and identifying contributing sources, and estimating their relative contribution to elevated exposure (source apportionment).
 - Assessment of whether an air district should update and implement the risk reduction audit and emissions reduction plan for any facility if the facility causes or significantly contributes to the high cumulative exposure burden.
 - Assessment of available measures for reducing emissions including BACT, BARCT, and best available control technology for toxics (TBACT).
- CARB will select locations for preparation of Community Emission Reduction Plans by October 1, 2018. CARB will select additional locations annually thereafter.
 - Within one year, the air district will adopt Community Emission Reduction Plans in consultation with CARB, individuals, community-based organizations, affected sources, and local governmental bodies.
 - The Community Emission Reduction Plans must be consistent with the state-wide strategy, and include emission reduction targets, specific reduction measures, a schedule for implementation of the measures, and an enforcement plan.
 - The Community Emission Reduction Plans must be submitted to CARB for review and approval.
 - The Community Emission Reduction Plans must achieve emission reductions in the community, based on monitoring or other data.

- The air district must prepare an annual report summarizing the results and actions taken to further reduce emissions.
- CARB will provide grants to community-based organizations for technical assistance and to support community participation in identification of communities with high exposure burden, and development and implementation of the Community Emission Reduction Plans.

AB 617 represents a significant enhancement to the approach CARB and local air districts take in addressing local air quality issues. The Air District has implemented and established a number of programs that support the goals and intent of AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics “Hot Spots” Program, and Air District Rule 11-18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, the requirements of AB 617 formalize the requirements and establish goals and timelines for implementation.

2.5 PROJECT DESCRIPTION

The Expedited BARCT Implementation Schedule will consist of the implementation of several rule development projects in order to fulfill the requirements of AB 617. The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead. The air basin is designated as nonattainment for ozone (O₃) and particulate matter (PM_{2.5} and PM₁₀) under California ambient air standards, therefore, the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NO_x)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM₁₀)
- Particulate Matter less than 2.5 microns (PM_{2.5})
- Sulfur Dioxide (SO₂)

NO_x and ROG are included because they are precursors for ozone formation. SO₂ may contribute to the formation of condensable PM (i.e. formed in the emissions plume from the stack) at certain types of sources, so PM control strategies may include SO₂ limits.

A list of facilities, sources, and emissions were developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. This list of facilities was reduced to 19 “industrial” facilities, which includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation (17 CCR § 95890(a)). These 19 industrial Cap-and-Trade facilities encompass 1,899 individual sources in 50 source categories. These sources were reviewed for the amount of emissions and existing controls that may already comply with BARCT. After screening

AB617 Expedited BARCT Implementation Schedule

for these sources with emissions greater than 10 pounds per day and sources that have not already achieved BARCT, the population of sources was reduced to the following:

- NO_x: 21 source categories, 73 sources representing 30% of the emissions (1,764 tpy)
- ROG: 23 source categories, 259 sources representing 93% of the emissions(2,430 tpy)
- PM: 16 source categories, 124 sources representing 92% of the emissions (1,851 tpy)
- SO₂: 15 source categories, 102 sources representing 71% of the emissions (3,651 tpy)

The Air District reviewed available information on current achievable emission limits and potential controls for each source category and pollutant. This information included guidelines and recent determinations of BACT, reasonably available control technology (RACT), and lowest achievable emission rate (LAER) from EPA, CARB, and other air districts. Six potential priority rule development projects have been identified for inclusion in the Expedited BARCT Implementation Schedule. Potential priority rule development projects are shown in Table 2-1.

TABLE 2-1 – BARCT Rule Development Projects

PROPOSED RULE DEVELOPMENT PROJECTS – EXPEDITED BARCT IMPLEMENTATION SCHEDULE		
Project Name	Pollutant	Rule Development Project Summary
Organic Liquid Storage Tanks	ROG TACs	Regulation 8, Rule 5: Storage of Organic Liquids may be amended to specifically address ROGs and TACs emissions from external floating roof tanks storing organic liquids. Emission reductions are expected from installing domes on external floating roof tanks and capturing emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit to a thermal incinerator.
Petroleum Wastewater Treating	ROG	The Air District has addressed ROG emissions from petroleum wastewater treatment facilities (Rule 8-8 Wastewater Collection and Separation Systems) in previous rule developments. This project will review each of the five Bay Area refineries for any opportunities for reduction of wastewater ROG's. BACT for refinery wastewater systems includes the use of entirely enclosed systems in addition to good control practices.
Portland Cement Manufacturing	PM SO ₂	BARCT levels are still under development for condensable PM emissions from cement kilns; however, controls will likely involve the reduction of SO ₂ , ammonia, or other condensable components and precursors. Expedited BARCT implementation for SO ₂ emissions reductions includes the judicious selection and use of raw materials, dry scrubbing, and dry sorbent (lime) injection.
Refinery Fluid Catalytic Crackers and CO Boilers	PM SO ₂	PM and SO ₂ emissions reductions are expected through optimization of ammonia injection, additional ESP capacity, optimization of newer catalyst additives, and/or wet gas scrubbing.
Refinery Heavy Liquid Leaks	ROG	Amendments to Regulation 8, Rule 18: Equipment Leaks (Rule 8-18) in December 2015 addressed equipment that service heavy liquids at these sources, but those amendments have not yet been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. BAAQMD is coordinating with each of the five Bay Area refineries to conduct a Heavy Liquid Leak Study. The study is designed to determine appropriate emission factors for heavy liquid leaks. The results of the study are expected by Fall 2018. BARCT levels will likely be set after the study has concluded; implementation is expected to involve additional leak detection and repair (LDAR) provisions for components in heavy liquid service.
Petroleum Coke Calcining	NOx	Regulation 9, Rule 14: Petroleum Coke Calcining Operations (Rule 9-14), which currently only addresses SO ₂ emissions, may be amended to address NOx emissions. Technologies available for NOx reduction in petroleum coke calcining operations is expected to include SCRs and LoTOx injection systems.

2.6 SOURCES THAT MAY BE SUBJECT TO BARCT

The overall purpose of the Expedited BARCT Implementation Schedule is to reduce criteria pollutant emissions from industrial sources that participate in CARB's GHG Cap-And-Trade program. Emission of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities. Expedited BARCT implementation would apply to a wide range of commercial and industrial facilities including petroleum refineries, chemical plants and manufacturing operations. Table 2-2 shows the most likely types of facilities anticipated to be subject to BARCT and the primary emissions that would be controlled.

TABLE 2-2

**Summary of Facilities and Sources Where BARCT May Apply
Under the Expedited BARCT Requirements**

Facility	Sources	Pollutants Controlled
Refineries	Fugitive Emissions (tanks, valves, pumps, compressors) Fluidized Catalytic Cracking Units CO Boilers Wastewater Treatment Operations	ROG PM SO ₂
Petroleum Coke Calcining	Coke Calciners	NO _x
Cement Manufacturing	Cement Kiln	PM SO ₂
Refineries, Chemical Plants, Bulk Storage and Transfer Operations, and General Manufacturing	Organic Liquid Storage Tanks	ROG

2.6.1 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). Crude oil that originates from different geographical locations may vary with respect to its composition, thus, potentially generating different types and amounts of emissions. The types of equipment where BARCT may be applied under the expedited BARCT requirements are further described below.

Fugitive Emissions Sources: Petroleum refineries include 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 and do not include pollutants vented to an exhaust stack before release to the atmosphere. Generally, any processes or transfer areas where leaks can occur are sources of fugitive emissions. Fugitive emissions sources include, but are not limited to the following: valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, pressure relief devices, and diaphragms in ROG service. Fugitive emissions are generally controlled through leak detection and repair (LDAR) programs. Similarly, tanks storing crude oil or petroleum products also produce fugitive emissions.

Fluid Catalytic Cracking Units (FCCUs) and CO Boilers: FCCUs are complex processing units that convert heavy components of crude oil into light, high-octane products that are required in the production of gasoline. Each FCCU consists of a reaction chamber, a catalyst regenerator, and a fractionator. The cracking process begins in the reaction chamber where fresh catalyst is mixed with pre-heated heavy oils. A

chemical reaction occurs that converts the heavy oil into a cracked hydrocarbon vapor mixed with catalyst. As the cracking reaction progresses, the cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into lighter hydrocarbon components such as light gases, gasoline, light gas oil, and cycle oil. The catalyst becomes coated with carbonaceous material (coke) during its exposure to the hydrocarbon feedstock. FCCUs include a catalyst regenerator where coke is burned off the surface of the catalyst to restore its activity so it can be re-used. Catalyst regenerators may be designed to burn the coke completely to carbon dioxide (full burn) or to only partially burn the coke to a mixture of CO and CO₂ (partial burn). Because the flue gas from these partial burn regenerators has high levels of CO, the flue gas is vented to a CO boiler where the CO is further combusted to CO₂. FCCUs and associated CO boilers can generate substantial PM, NO_x, and SO₂ emissions.

Petroleum Wastewater Treating: All refineries employ some form of wastewater treatment, so water effluents can safely be reused at the refinery or discharged. Wastewater treatment operations provide a means of treating water that has come into contact with petroleum hydrocarbons, and, as such, are a potential source of ROG emissions. The design of wastewater treatment plants is complicated by the diversity of refinery pollutants, including oil, phenols, sulfides, dissolved, solids, and toxic chemicals. Although the treatment processes employed by refineries vary greatly they generally include drain systems, neutralizers, oil/water separators, settling chambers, clarifiers, dissolved air flotation systems, coagulators, and activated sludge units.

Drain systems consist of individual process drains, where oily water from various sources is collected, and junction boxes, which receive the oily water from multiple drains. The first stage of a typical wastewater treatment process is the oil-water separator, which physically separates the free oil and solids from the water. Gravity allows any oil in the water to rise to the surface of the separator and any solid particles to sink to the bottom. A continually moving scraper system pushes oil to one end and the solids to the other. Both are removed and the recovered oil is sent back to the refinery for reprocessing. Small suspended oil particles are then typically removed in the dissolved air flotation unit. Wastewater is sent to the activated sludge units, where naturally-occurring microorganisms feed on the dissolved organics in the wastewater, and convert them to water, CO₂ and nitrogen gas, which can be safely released into the atmosphere. Finally, wastewater enters the clarifying tanks, where the microorganisms settle to the bottom while the treated wastewater flows away.

2.6.2 PETROLEUM COKE CALCINING

Petroleum coke, the heaviest portion of crude oil, cannot be recovered in the normal refining process. Instead, petroleum coke is processed in a delayed coker unit 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 can be used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined (removing impurities) 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 to the bottom of the kiln, it rests in the kiln for approximately one additional hour to eliminate any remaining moisture, impurities, and hydrocarbons. Hot gases from the calciner are sent to a pyroscrubber that removes particulates through a combination of settling and incineration and sulfur compounds are oxidized to SO₂. 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 and sold for industrial uses.

2.6.3 CEMENT MANUFACTURING

Cement is manufactured in a cement kiln using a pyroprocess or high temperature reactor that is constructed along a longitudinal axis with segmented rotating cylinders whose connected length is anywhere from 50 to 200 yards in length. The pyroprocess in the kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in the kiln, the drying and pre-heating zone, operates at a temperature between 1,000 °F and 1,600 °F and evaporates any remaining water in the raw mix of materials entering the kiln. The second phase, the calcining zone, operates at a temperature between 1,600 °F and 1,800 °F and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases CO₂. During the third phase, the burning zone operates on average at 2,200 °F to 2,700 °F (though the flame temperature can at times exceed 3,400 °F) during which several reactions and side reactions occur. As the materials move towards the discharge end, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. The red-hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage.

As indicated above cement manufacturing occurs at high temperatures using several combustion fuels. Fuels that have been used for primary firing include coal, petroleum coke, heavy fuel oil, natural gas, landfill off-gas and oil refinery flare gas. High carbon fuels such as coal are preferred for kiln firing, because they yield a luminous flame. The clinker is brought to its peak temperature mainly by radiant heat transfer, and a bright (i.e. high emissivity) and hot flame is essential for this. Combustion emissions are exhausted through the kiln's stack.

Relative to cement manufacturing, fugitive dust is wind-driven particulate matter emissions from any disturbed surface work area that are generated by wind action alone.

The process of making cement begins with the acquisition of raw materials, predominantly limestone rock (calcium carbonate) and clay, which exist naturally in rocks and sediment on the earth's surface. These and other materials used to manufacture cement are typically mined at nearby quarries and comprise "raw mix." The raw mix is refined by a series of mechanical crushing and grinding operations to segregate and eventually reduce the size of each component to 0.75 inch or smaller before being conveyed to storage.

2.6.4 ORGANIC LIQUID STORAGE FACILITIES

Storage vessels containing organic liquids can be found in many industries, including: (1) petroleum producing and refining; (2) petrochemical and chemical manufacturing; (3) bulk storage and transfer operations; and (4) other industries consuming or producing organic liquids. Organic liquids in the petroleum industry generally are mixtures of hydrocarbons having dissimilar true vapor pressures (for example, gasoline and crude oil). Organic liquids in the chemical industry are composed of pure chemicals or mixtures of chemical with similar vapor pressures (for example, benzene or a mixture of isopropyl and butyl alcohols).

Six basic tank designs are used for organic liquid storage vessels: fixed roof (vertical and horizontal), external floating roof, domed external (or covered) floating roof, internal floating roof, variable vapor space, and pressure tanks (low and high). Tanks associated with refineries comprise over 95 percent of the AB 617 organic liquid storage tanks.

ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of tank. Emissions from fixed roof tanks are a result of evaporative losses during storage (breathing losses or standing storage losses) and evaporative losses during filling and emptying operations (referred to as working losses). External and internal floating roof tanks are ROG emission sources because of evaporative losses that occur during standing storage and withdrawal of liquid from the tank. Standing storage losses are a result of evaporative losses through rim seams, deck fittings, and/or deck seams. Pressure tank losses occur when connecting to or disconnecting from the tank.

2.7 BARCT EMISSION CONTROL TECHNOLOGIES

The expedited implementation of BARCT would apply to existing facilities in the Bay Area that are generally large sources of emissions and included in the CARB GHG Cap-and-Trade program as industrial facilities. The overall purpose of the Expedited BARCT Implementation Schedule is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade program. Emissions of criteria pollutants and TACs are often associated with GHG emission sources.

To comply with the BARCT requirements for affected facilities, operators could reduce operations or install BARCT equipment, which are different types of air pollution control

equipment or measures. The type of emission capture and control technology that may be used depends on the specific type of pollutant to be controlled. The most common air pollution control measures that are likely to be encountered as a result of the proposed implementation of expedited BARCT are categorized into the following groups and are summarized in Table 2-3:

- Installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit;
- Covering lift stations, manholes, junction boxes, conveyances and other wastewater facilities at refineries and venting ROG emissions to a vapor combustor;
- Requiring additional lime injection on cement kilns to control SO₂ in order to reduce condensable PM emissions;
- Control PM emissions from FCCUs using SO₂ reducing catalyst additives, additional ESP capacity, or wet gas scrubbers;
- Reducing ROG emissions from fugitive components in heavy liquid service at refineries through increased LDAR programs;
- Reducing NO_x emissions from coke calcining facilities through the use of SCR units and/or LoTOx system with a wet scrubber.

TABLE 2-3

Expedited BARCT Measures and Target Substances

BARCT Measure	Pollutant
Additional Controls on Organic Liquid Storage Tanks	ROG
Enclosures and Vapor Combustors at Refinery Wastewater Treatment Plants	ROG
Additional Lime Injection at Cement Plants Systems	PM and SO ₂
Wet Gas Scrubbers, ESPs, and SO ₂ Reducing Catalysts at Refinery FCCUs and CO Boilers	PM and SO ₂
Increase LDAR for Equipment in Heavy Liquid Service Refineries	ROG
SCR and LoTOx (wet scrubber) at Petroleum Coke Calciners	NO _x

The following subsections briefly describe the most likely types of control technologies that would be used to comply with the expedited BARCT measures. Table 2-4 summarizes the estimated number of each type of air pollution control technology that may be used to meet emissions reductions under the expedited BARCT requirements for the purposes of this EIR.

TABLE 2-4

Expedited BARCT Expected Air Pollution Control Equipment

Type of Air Pollution Control	Number of Units Potentially Installed Under Expedited BARCT	Notes/Comments
Vapor Recovery Unit and/or Thermal Incinerator on Organic Liquid Storage Tanks	Up to 20 domes, and up to 10 VRU/Incinerators	
Vapor Combustor on Refinery Wastewater Treatment Plants	Up to 5	Assumes that a refinery would implement one system for their wastewater treatment plant, and potentially all 5 refineries would need some type of control
Additional Lime Injection at Cement Plants	1	
Wet Gas Scrubbers/ESPs	Up to 3	Assumes highest impact scenario would involve WGS/ESP installation on up to 3 FCCUs
Increased LDAR in Heavy Liquid Service at Refineries	5	Increased scope of LDAR will likely impact all 5 refineries
SCR or LoTOX (wet scrubber) at Petroleum Coke Calciners	1	

2.7.1 Additional Controls on Organic Liquid Storage Tanks

ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of emission source.

Potential ROG emission reductions would be achieved by installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit (VRU) flowing back to the tank for recovery or to a thermal incinerator. Thermal oxidizers, or thermal incinerators, are combustion devices that control ROG and volatile TAC emissions by combusting them to CO₂ and water. Domed roofs on external floating roofs without VRUs would reduce ROG emissions by limiting wind effects.

2.7.2 Enclosures and Vapor Combustors at Refinery Wastewater Treatment Plants

The main component of atmospheric emissions from refinery wastewater treatment plants are fugitive ROG emissions and dissolved gases that evaporate from the surfaces of wastewater residing in open process drains, separators, and ponds. The control of wastewater treatment plant emissions involves covering systems where emission generation is greatest (such as oil/water separators and settling basins) and removing dissolved gases from water streams with sour water strippers before contact with the atmosphere. Covering wastewater operations potentially can achieve greater than 90 percent reduction of wastewater system emissions. In addition, all lift stations, manholes, junction boxes, conveyances and any other wastewater facilities should be covered and all emissions routed to a vapor combustor with a destruction removal efficiency (DRE) of 99 percent for control. Vapor combustors are combustion devices that control ROG emissions by combusting them to carbon dioxide and water.

2.7.3 Lime Injection at Cement Plants

The formation of SO₂ in cement kilns is a product of the chemical make-up of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. In a lime injection system, hydrated lime powder is injected into the flue gas. SO₂ reacts with lime (calcium carbonate) and is captured in the baghouse as calcium sulfate. The hydrated lime usually absorbs up to 60% of the SO₂ in the gases if injected at the correct temperature. The one cement kiln in the District currently operates a lime injection system for the control of hydrochloride emissions. The use of additional lime injection is expected to reduce SO₂ emissions even further.

2.7.4 Wet Gas Scrubbers

In wet scrubbing processes, liquid or solid particles are removed from a gas stream by transferring them to a liquid. This addresses only wet scrubbers for control of particulate matter. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. Most wet scrubbing systems operate with particulate collection efficiencies over 95 percent (U.S. EPA, 2017).

There are three energy usage levels for wet scrubbers. A low energy wet scrubber is capable of efficiently removing particles greater than about 5-10 micrometers in diameter. A medium energy scrubber is capable of removing micrometer-sized particles, but is not very efficient on sub-micrometer particles. A high-energy scrubber is able to remove sub-micrometer particles.

A spray tower scrubber is a low energy scrubber and is the simplest wet scrubber used for particulate control. It consists of an open vessel with one or more sets of spray nozzles to distribute the scrubbing liquid. Typically, the gas stream enters at the bottom and passes upward through the sprays. The particles are collected when they impact the droplets. This is referred to as counter-current operation. Spray towers can also be operated in a cross-current arrangement. In cross-current scrubbers, the gas flow is horizontal and the

liquid sprays flow downward. Cross-current spray towers are not usually as efficient as counter-current units.

The most common high energy wet scrubber is the venturi, although it can also be operated as a medium energy scrubber. In a fixed-throat venturi, the gas stream enters a converging section where it is accelerated toward the throat section. In the throat section, the high-velocity gas stream strikes liquid streams that are injected at right angles to the gas flow, shattering the liquid into small drops. The particles are collected when they impact the slower moving drops. Following the throat section, the gas stream passes through a diverging section that reduces the velocity.

All wet scrubber designs incorporate mist eliminators or entrainment separators to remove entrained droplets. The process of contacting the gas and liquid streams results in entrained droplets, which contain the contaminants or particulate matter. The most common mist eliminators are chevrons, mesh pads, and cyclones. Chevrons are simply zig-zag baffles that cause the gas stream to turn several times as it passes through the mist eliminator. The liquid droplets are collected on the blades of the chevron and drain back into the scrubber. Mesh pads are made from interlaced fibers that serve as the collection area. A cyclone is typically used for the small droplets generated in a venturi scrubber. The gas stream exiting the venturi enters the bottom of a vertical cylinder tangentially. The droplets are removed by centrifugal force as the gas stream spirals upward to the outlet.

2.7.5 Electrostatic Precipitator

An ESP is a control device designed to remove particulate matter (both PM₁₀ and PM_{2.5}) 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. When enough particulates have accumulated, the collectors are shaken to dislodge the dust, causing it to fall by gravity to hoppers below and then removed by a conveyor system for disposal or recycling. ESPs can handle large volumes of exhaust gases and because no filters are used, ESPs can handle hot gases from 350 °F to 1,300 °F.

2.7.6 SO₂ Reducing Catalysts

To help reduce condensable particulate matter formation from sulfur compounds, SO_x reducing additives (catalysts) are used for reducing the production of SO_x by-products in FCCUs. A SO_x reducing catalyst is a metal oxide compound such as aluminum oxide (Al₂O₃), magnesium oxide (MgO), vanadium pentoxide (V₂O₅) 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 SO₂, CO, and CO₂ by-products are formed. A portion of SO₂ will react with excess oxygen and form SO₃, which will either stay in the flue gas or react with the metal oxide in the SO_x reducing catalyst to form 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 (H₂S). The net effect of these reactions is that the quantity of SO₂ in the regenerator is typically reduced between 40 to 65 percent while the quantity of H₂S in the reactor is increased. Generally, the increase in H₂S is handled by sulfur recovery processes located elsewhere within a refinery.

2.7.7 Enhanced LDAR for Components in Heavy Liquid Service

Oil refineries, chemical plants, bulk plants, bulk terminals, and other facilities that store, transport and use organic liquids may occasionally have leaks wherever there is a connection between two pieces of equipment, and lose some organic material as fugitive ROG emissions. Valves, pumps, and compressors can also leak organic materials. The District Rule 8-18 requires such facilities to maintain LDAR programs. The rule originally required the monitoring of components in light hydrocarbon liquid service, but was expanded in 2015 to include equipment in heavy hydrocarbon liquid service. Those amendments have not been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. The District is in the process of conducting studies to determine appropriate emission factors for heavy liquid leaks. Completion of the heavy liquid leak study has been problematic, because some heavy hydrocarbon liquids are condensing and coating the leak detection sensors. The study approach has been re-configured and the results are expected by Fall 2018. The results of the study will be used to determine appropriate revisions to Rule 8-18, e.g., types of monitoring instruments, frequency of monitoring, leak concentration limits, time allowed for repair of the leak, recordkeeping requirements, etc.

2.7.8 Selective Catalytic Reduction (SCR) at Petroleum Coke Calciners

SCR is post combustion control equipment for NO_x control of combustion sources such as boilers and process heaters and is capable of reducing NO_x emissions by as much as 95 percent or higher. A typical SCR system consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, and exhaust stack plus ancillary electronic instrumentation and operations control equipment. An SCR system reduces NO_x by injecting a mixture of ammonia and air into the flue gas exhaust stream from the combustion equipment. This mixture flows into the SCR reactor where the catalyst, ammonia and oxygen in the flue gas exhaust reacts with NO and NO₂ to form nitrogen and water in the presence of the

catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NO_x for optimum control efficiency, though the ratio may vary based on equipment-specific NO_x reduction requirements. SCR catalysts are available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide that is coated with either tungsten trioxide, molybdenic anhydride, vanadium pentoxide, iron oxide, or zeolite catalysts. These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of five years or more. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, etc. (SCAQMD, 2015).

For conventional SCRs, the minimum temperature for NO_x reduction is 500°F and the maximum operating temperature for the catalyst is 800 °F. The presence of particulates, heavy metals, sulfur compounds, and silica in the flue gas exhaust can limit catalyst performance. Minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range helps to avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as “ammonia slip.” Depending on the type of combustion equipment utilizing SCR, the typical amount of ammonia slip can vary between less than five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life.

2.7.9 LoTOx (wet scrubber) at Petroleum Coke Calciners

The LoTOx™ is a registered trademark of Linde LLC (previously BOC Gases) and was later licensed to BELCO of Dupont for refinery applications. LoTOx™ stands for “Low Temperature Oxidation” process in which ozone (O₃) is used to oxidize insoluble NO_x compounds into soluble NO_x compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOx™ process is a low temperature application, optimally operating at about 325 °F.

A typical combustion process produces about 95 percent NO and five percent NO₂. Because both NO and NO₂ are relatively insoluble in an aqueous solution, a WGS alone is not efficient in removing these insoluble compounds from the flue gas stream. However, with a LoTOx™ system and the introduction of O₃, NO and NO₂ can be easily oxidized into a highly soluble compound N₂O₅ and subsequently converted to nitric acid (HNO₃). Then, in a wet gas scrubber for example, the HNO₃ is rapidly absorbed in caustic (NaOH), limestone or lime solution. The LoTOx™ process can be integrated with any type of wet scrubbers (e.g., venturi, packed beds), semi-dry scrubbers, or wet ESPs. In addition, because the rates of oxidizing reactions for NO_x are fast compared to the very slow SO₂ oxidation reaction, no ammonium bisulfate ((NH₄)HSO₄) or sulfur trioxide (SO₃) is formed (Confuorto and Sexton, 2007).

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES, AND CUMULATIVE IMPACTS

Introduction

Air Quality

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

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3.0 ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS

3.1 INTRODUCTION

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the Expedited BARCT Implementation Schedule, and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study prepared by the Air District for the Expedited BARCT Implementation Schedule (BAAQMD, 2018) (see Appendix A). The Initial Study concluded that the approval of the Expedited BARCT Implementation Schedule could potentially result in significant environmental impacts to Air Quality, Hazards and Hazardous Materials, Hydrology and Water Quality, and Utilities and Service Systems. Water demand impacts were considered to be potentially significant in both the Hydrology and Water Quality, and Utilities and Service Systems section. The potential impacts on water demand were considered to be significant in both the Hydrology and Water Quality and Utilities Sections of the Initial Study. The impacts on water demand have been consolidated into the Hydrology and Water Quality section.

The potential impacts identified in the Initial Study will be evaluated in this EIR. Included for each impact category is a discussion of the: (1) Environmental Setting; (2) Regulatory Setting; (3) Significance Criteria; (4) Environmental Impacts; (5) Mitigation Measures (if necessary and available); and (6) Cumulative Impacts. A description of each subsection follows.

3.1.1 ENVIRONMENTAL SETTING

CEQA Guidelines §15360 (Public Resources Code Section 21060.5) defines “environment” as “the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance.” CEQA Guidelines §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting is intended to be no longer than is necessary to gain an understanding of the significant effects of the proposed project and its alternatives.

This Chapter describes the existing environment in the Bay Area as it exists at the time the environmental analysis commenced (2018) to the extent that information is available. 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 Expedited BARCT Schedule 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 that impacts on Air Quality, Hazards and Hazardous Materials, and Hydrology and Water Quality (including water demand) associated with the proposed project were potentially significant and are evaluated in this EIR.

3.1.2 SIGNIFICANCE CRITERIA

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 Air Districts CEQA Air Quality Guidelines (BAAQMD, 2017a).

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 CEQA Guidelines also require the EIR to identify significant environmental effects that may result from a proposed project (CEQA Guidelines §15126.2(a)). Direct and indirect significant effects of a project on the environment must be identified and described, with consideration given to both short- and long-term impacts. The potential impacts associated with each resource 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 may also apply to individual projects at the time any permits are submitted in the future in response to the regulation or regulations that may be approved by the Board and the potential for any control equipment or other design modifications to affected facilities to have secondary adverse environmental impacts will be evaluated at that time.

3.1.4 MITIGATION MEASURES

If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4). The analyses in this chapter describe the potential for significant adverse impacts and identify mitigation measures where appropriate. 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 2017 Clean Air Plan, the most recent air plan for the Bay Area (BAAQMD, 2017). The area evaluated for cumulative air 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.

CHAPTER 3.2

AIR QUALITY IMPACTS

Introduction
Environmental Setting
Regulatory Setting
Significance Criteria
Air Quality Impacts

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3.2 AIR QUALITY

This subchapter of the EIR evaluates the potential air quality impacts associated with implementation of the Expedited BARCT Implementation Schedule, which aims to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system.

As discussed in the Initial Study, in accordance with AB 617, the purpose of the Expedited BARCT Implementation Schedule is to implement several rule development projects that utilize BARCT to reduce criteria pollutant emissions from sources participating in the GHG Cap-and-Trade system in the Bay Area. However, certain control measures have the potential to increase emissions of other pollutants, such as GHGs and criteria pollutants. Adverse impacts include increased emissions associated with construction activities and combustion sources from certain types of air pollution control equipment. The NOP/IS (see Appendix A) determined that air quality impacts of the proposed project are potentially significant. Project-specific and cumulative adverse air quality impacts associated with the proposed rule amendments have been evaluated in Chapter 3.2.6 of this EIR.

3.2.1 ENVIRONMENTAL SETTING

3.2.1.1 Criteria Pollutants

Ambient Air Quality Standards

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards (AAQS) 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 (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. The state and national NAAQS for each of these pollutants and their effects on health are summarized in Table 3.2-1.

TABLE 3.2-1

Federal and State Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	No Federal 1-hr standard 0.070 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	0.030 ppm, annual avg. 0.18 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.100 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. >	No Federal 24-hr Standard> 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 ₁₀)	20 µg/m ³ , ann. arithmetic mean > 50 µg/m ³ , 24-hr average>	No Federal annual Standard 150 µg/m ³ , 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 _{2.5})	12 µg/m ³ , annual arithmetic mean> No State 24-hr Standard	12 µg/m ³ , annual arithmetic mean> 35 µg/m ³ , 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m ³ , 24-hr avg. >=	No Federal Standard	(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 ³ , 30-day avg. >= No State Calendar Quarter Standard No State 3-Month Rolling Avg. Standard	No Federal 30-day avg. Standard 1.5 µg/m ³ , calendar quarter> 0.15 µg/m ³ 3-Month Rolling average	(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)	No Federal Standard	Visibility based standard, not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

U.S. EPA requires CARB and Air Districts to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the Air District monitors levels of various criteria pollutants at 25 monitoring stations within the San Francisco Bay Area. A summary of the 2017 maximum concentration and number of days exceeding state and federal ambient air standards at the Air District monitoring stations are presented in Table 3.2-2.

Chapter 3: Environmental Setting, Impacts and Mitigation Measures

TABLE 3.2-2
Bay Area Air Pollution Summary – 2017

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM ₁₀				PM _{2.5}				
	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 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr Days	Max 24-Hr	Nat 24-Hr Days	3-Yr Avg	Ann Avg	3-Yr Avg
North Counties	(ppb)						(ppm)			(ppb)				(ppb)				(µg/m ³)				(µg/m ³)				
Napa	98	1	84	2	2	63	5.6	4.7	0	53	7	0	0	-	-	-	-	-	-	-	-	199.1	13	35	13.7	10.9
San Rafael	88	0	63	0	0	58	2.6	1.6	0	53	10	0	0	-	-	-	-	17.7	94	0	2	74.7	8	27	9.7	8.2
Sebastopol	87	0	71	1	1	53	2.1	1.6	0	35	5	0	0	-	-	-	-	-	-	-	-	81.8	4	21	8.1	6.5
Vallejo	105	1	88	2	2	61	3.1	2.1	0	49	8	0	0	5.9	2.17	0	0	-	-	-	-	101.9	9	30	11.6	9.5
Coast/Central Bay																										
Berkeley Aquatic Pk*	58	0	49	0	0	*	2.2	1.7	0	123	16	1	0	-	-	-	-	-	-	-	-	52.0	7	*	9.1	*
Laney College Fwy	-	-	-	-	-	-	1.9	1.3	0	68	17	0	0	-	-	-	-	-	-	-	-	70.8	8	27	11.6	10.1
Oakland	136	2	100	2	2	54	3.2	2.2	0	65	10	0	0	-	-	-	-	-	-	-	-	70.2	7	24	9.4	7.9
Oakland-West	87	0	68	0	0	48	6.0	2.1	0	52	13	0	0	16.9	2.2	0	0	-	-	-	-	56.0	7	28	12.8	10.6
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	2.9	0	0	-	-	-	-	-	-	-	-	-
San Francisco	87	0	54	0	0	47	2.5	1.4	0	73	11	0	0	-	-	-	-	22.0	77	0	2	49.9	7	27	9.7	8.3
San Pablo	104	3	80	2	2	52	2.5	1.9	0	48	8	0	0	8.3	2.7	0	0	20.3	95	0	4	71.2	9	30	10.8	9.3
Eastern District																										
Bethel Island	90	0	71	1	2	68	1.6	1.0	0	34	5	0	0	5.3	3.5	0	0	16.3	52	0	1	-	-	-	-	-
Concord	82	0	70	0	0	66	1.7	1.3	0	41	7	0	0	13.2	2.6	0	0	13.3	41	0	0	89.4	6	26	12.0	8.9
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	23.5	5.6	0	0	-	-	-	-	-	-	-	-	-
Fairfield	80	0	62	0	0	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	109	5	86	6	6	75	-	-	-	45	9	0	0	-	-	-	-	-	-	-	-	41.5	2	25	8.5	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	15.9	3.1	0	0	-	-	-	-	-	-	-	-	-
San Ramon	92	0	75	2	2	68	-	-	-	31	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	139	2	110	3	4	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	115	2	86	2	2	56	2.8	1.4	0	67	11	0	0	-	-	-	-	-	-	-	-	60.8	6	23	9.1	7.7
Santa Clara Valley																										
Gilroy	96	1	84	1	1	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.4	2	18	75.5	6.1
Los Gatos	93	0	75	3	3	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	121	3	98	4	4	67	2.1	1.8	0	68	12	0	0	3.6	1.1	0	0	21.6	70	0	6	49.7	6	27	9.5	9.3
San Jose Freeway	-	-	-	-	-	-	2.6	1.8	0	77	17	0	0	-	-	-	-	-	-	-	-	48.4	8	28	10.8	9.5
San Martin	96	1	86	3	3	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Days over Standard		6		6	6				0			1	0			0	0			0	6		18			

Source: BAAQMD, 2018.

*Near-road air monitoring at Berkeley Aquatic Park began on July 1, 2016. Therefore, 3-year average statistics for ozone and PM_{2.5} are not available.

(ppb) = parts per billion (ppm) = parts per million, (µg/m³) = micrograms per cubic meter

AB 617 Expedited BARCT Implementation Schedule

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The long-term trend of ambient concentrations of air pollutants and the number of days on which the region exceeds (AAQS) have generally declined, although some year-to-year variability primarily due to meteorology, causes some short-term increases in the number of exceedance days (see Table 3.2-3). The Air District is in attainment of the State AAQS for CO, NO₂, and SO₂. However, the Air District does not comply with the State 24-hour PM₁₀ standard, annual PM₁₀ standard, and annual PM_{2.5} standard. The Air District is unclassifiable/attainment for the federal CO, NO₂, SO₂, Pb, and PM₁₀ standards. A designation of unclassifiable/attainment means that the U.S. EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

The 2017 air quality data from the Air District monitoring stations are presented in Table 3.2-2. No monitoring stations measured an exceedance of any of State or federal AAQS for CO and SO₂. There was one exceedance of the federal NO₂ AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM₁₀ standards. The State 24-hour PM₁₀ standard was exceeded on six days in 2017, at the San Jose monitoring station (see Table 3.2-2).

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour PM_{2.5} standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 24-hour PM_{2.5} standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

TABLE 3.2-3

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

YEAR	OZONE			CARBON MONOXIDE				NO _x		SULFUR DIOXIDE		PM ₁₀		PM _{2.5}
	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
2008	19	9	20	0	0	0	0	0	0	2	0	0	5	12
2009	11	11	13	0	0	0	0	0	0	0	0	0	1	11
2010	11	8	11	0	0	0	0	0	0	0	0	0	2	6
2011	9	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	8	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	9	3	10	0	0	0	0	0	0	0	0	0	2	3
2015	12	7	12	0	0	0	0	0	0	0	0	0	1	9
2016	15	6	15	0	0	0	0	0	0	0	0	0	0	0
2017	6	6	6	0	0	0	0	1	0	0	0	0	6	18

Source: BAAQMD, 2018

3.2.1.2 Criteria Pollutant Health Effects

3.2.1.2.1 Ozone

Ozone is not emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons, or reactive organic gases (ROG, also commonly referred to as reactive organic gases (ROG), and nitrogen oxides (NO_x), in the presence of sunlight. ROG and NO_x are referred to as ozone precursors.

Ozone, 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 mixing 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, ground level ozone is harmful, is a highly reactive oxidant, which accounts for its damaging effects on human health, plants and materials at the earth's surface.

Ozone is harmful to public health at high concentrations near ground level. Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat, and respiratory system and constrict the airways. Ozone also can aggravate other respiratory conditions such as asthma, bronchitis, and emphysema, causing increased hospital admissions. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation and permanently damage lung tissue. Ozone can also have negative cardiovascular impacts, including chronic hardening of the arteries and acute triggering of heart attacks. Children are most at risk as they tend to be active and outdoors in the summer when ozone levels are highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone's effects. Even healthy adults can be affected by working or exercising outdoors during high ozone levels.

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, reducing the respiratory system's ability to remove inhaled particles and fight infection while long-term exposure damages lung tissue. 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.

3.2.1.2.2 Reactive Organic Gases (ROGs)

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

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

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

3.2.1.2.3 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 used in 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.

3.2.1.2.4 Particulate Matter (PM₁₀ & PM_{2.5})

Particulate matter, or PM, consists of microscopically small solid particles or liquid droplets suspended in the air. PM can be emitted directly into the air or it can be formed from secondary reactions involving gaseous pollutants that combine in the atmosphere. Particulate pollution is primarily a problem in winter, accumulating when cold, stagnant weather comes into the Bay Area. PM is usually broken down further into two size distributions, PM₁₀ and PM_{2.5}. Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter 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 PM₁₀ and PM_{2.5}.

A consistent correlation between elevated ambient particulate matter (PM₁₀ and PM_{2.5}) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM_{2.5}) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM₁₀ and PM_{2.5}.

3.2.1.2.5 Nitrogen Dioxide (NO₂)

NO₂ is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N₂) and oxygen (O₂) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO₂. NO₂ is responsible for the brownish tinge of polluted air. The two gases, NO and NO₂, are referred to collectively as nitrogen oxides or NO_x.

In the presence of sunlight, NO₂ 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 (HNO₃) which reacts further to form nitrates, which are a component of PM₁₀.

NO₂ is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

3.2.1.2.6 Sulfur Dioxide (SO₂)

SO₂ is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H₂SO₄), which contributes to acid precipitation, and sulfates, which are a component of PM₁₀ and PM_{2.5}. Most of the SO₂ emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO₂ 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. SO₂ also causes plant damage, damage to materials, and acidification of lakes and streams.

3.2.1.3 Current Emissions Inventory

An emission inventory is a detailed estimate of air pollutant emissions from a range of sources in a given area, for a specified time period. Future projected emissions incorporate current levels of control on sources, growth in activity in the Air District and implementation of future programs that affect emissions of air pollutants.

3.2.1.3.1 Ozone

NO_x and ROG emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue to decline. ROG emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to ROG emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining and marketing. Area-wide ROG sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions. About 42 percent of anthropogenic ROG emissions in the Bay Area are from mobile source emissions, while 26 percent are from petroleum and solvent evaporation (see Table 3.2-4) (BAAQMD, 2017).

TABLE 3.2-4

**Anthropogenic Air Emission Inventory 2015
(tons per day)**

Source	ROG	NO _x
On-Road Motor Vehicles	59.6	128.1
Other Mobile Sources	49.2	122.2
Petroleum & Solvent Evaporation	67.3	--
Industrial and Commercial	15.4	3.0
Combustion	13.0	44.7
Other Sources	54.4	1.2

Source: BAAQMD, 2017

Approximately 84 percent of NO_x emissions in the Bay Area are produced by the combustion of fuels. Mobile sources of NO_x include motor vehicles, aircraft, trains, ships, recreation boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment. NO_x and ROG emissions have been reduced for both stationary and mobile sources due to more stringent regulations from CARB and the District, respectively (see Table 3.2-4) (BAAQMD, 2017).

3.2.1.3.2 Particulate Matter

Particulate matter (both PM₁₀ and PM_{2.5}) is a diverse mixture of suspended particles and liquid droplets (aerosols). PM includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust, wood smoke, and soil. Unlike the other criteria pollutants which are individual chemical compounds, PM includes all particles that are suspended in the air. PM is both directly emitted (referred to as direct PM or primary PM) and also formed in the atmosphere through reactions among different pollutants (this is referred to as indirect or secondary PM).

PM is generally characterized on the basis of particle size. Ultra-fine PM includes particles less than 0.1 microns in diameter. Fine PM (PM_{2.5}) consists of particles 2.5 microns or less in diameter. PM₁₀ consists of particles 10 microns or less in diameter. Total suspended particulates (TSP) includes suspended particles of any size.

Combustion of fossil fuels and biomass, primarily wood, from various sources are the primary contributors of directly-emitted Bay Area PM_{2.5} (BAAQMD, 2017). Biomass combustion concentrations are about 3-4 times higher in winter than during the other seasons, and its contribution to peak PM_{2.5} is greater. The increased winter biomass combustion sources reflect increased residential wood-burning during the winter season. The inventory of PM₁₀ and PM_{2.5} emission sources is provided in Table 3.2-5.

TABLE 3.2-5

**Particulate Emissions Inventory by Source, Annual Average 2015
(tons per day)**

Source	PM₁₀	PM_{2.5}
Residential Wood-Burning	12.0	11.8
Geological Dust	49.1	6.6
On-Road Motor Vehicles	12.0	5.6
Other Mobile Sources	5.5	5.6
Industrial Combustion	6.5	6.1
Industrial/Commercial Processes	7.6	4.7
Accidental Fires	4.4	3.8
Commercial Cooking	2.2	1.9
Animal Waste	9.8	0.9

Source: BAAQMD, 2017

3.2.1.4 Non-Criteria Pollutants Health Effects

Although the primary mandate of the Air District is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the Air District jurisdiction, the Air District 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. 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.
- The District's Community Air Risk Evaluation (CARE) Program has been implemented to identify areas where air pollution contributes most to health impacts and where populations are most vulnerable to air pollution; to reduce the health impacts in these areas; and to engage the community and other agencies to develop additional actions to reduce local health impacts.
- 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.
- The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities which was adopted November 15, 2017. This rule requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

3.2.1.4.1 TAC Health Effects

TACs can cause or contribute to a wide range of health effects. Acute (short-term) health effects may include eye and throat irritation. Chronic (long-term) exposure to TACs may cause more severe effects such as neurological damage, hormone disruption, developmental defects, and cancer. CARB has identified roughly 200 TACs, including diesel particulate matter (diesel PM) and environmental tobacco smoke.

Unlike criteria pollutants which are subject to ambient air quality standards, TACs are primarily regulated at the individual emissions source level based on risk assessment. Human outdoor exposure risk associated with an individual air toxic species is calculated as its ground-level concentration multiplied by an established unit risk factor for that air toxic species. Total risk due to TACs is the sum of the individual risks associated with each air toxic species.

Occupational health studies have shown diesel PM to be a lung carcinogen as well as a respiratory irritant. Benzene, present in gasoline vapors and also a byproduct of combustion, has been classified as a human carcinogen and is associated with leukemia. 1,3-butadiene, produced from motor vehicle exhaust and other combustion sources, has also been associated with leukemia. Reducing 1,3-butadiene also has a co-benefit in reducing the air toxic acrolein.

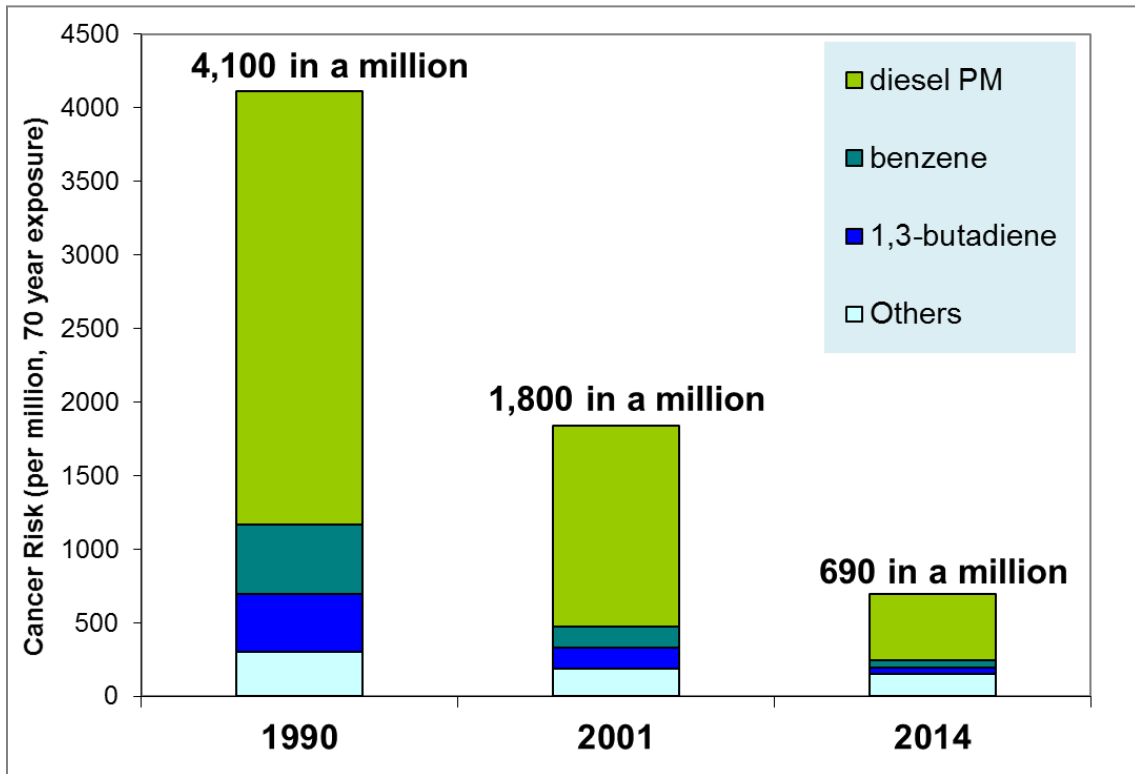
Acetaldehyde and formaldehyde are emitted from fuel combustion and other sources. They are also formed photo-chemically in the atmosphere from other compounds. Both compounds have been found to cause nasal cancers in animal studies and are also associated with skin and respiratory irritation. Human studies for carcinogenic effects of acetaldehyde are sparse but, in combination with animals studies, sufficient to support classification as a probable human carcinogen. Formaldehyde has been associated with nasal sinus cancer and nasopharyngeal cancer, and possibly with leukemia.

The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. Based on ambient air quality monitoring, and using OEHHA cancer risk factors,¹ the estimated lifetime cancer risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014, as shown in Figure 3.2-1. This represents an 80 percent decrease between 1990 and 2014 (BAAQMD, 2016).

The cancer risk related to diesel PM, which accounts for most of the cancer risk from TACs, has declined substantially over the past 15-20 years as a result of ARB regulations and Air District programs to reduce emissions from diesel engines. However, diesel PM still accounts for roughly 60 percent of the total cancer risk related to TACs.

¹ See CARB's Risk Management Guidance for Stationary Sources of Air Toxics, Discussion Draft, May 27, 2015, https://www.arb.ca.gov/toxics/rma/rma_guidancedraft052715.pdf and the Office Environmental Health Hazard Assessment's toxicity values at <http://oehha.ca.gov/media/CPFs042909.pdf>. The cancer risk estimates shown in Figure 3.2-1 are higher than the estimates provided in documents such as the Bay Area 2010 Clean Air Plan and the April 2014 CARE report entitled *Improving Air Quality and Health in Bay Area Communities*. It should be emphasized that the higher risk estimates shown in Figure 3.2-1 are due solely to changes in the methodology used to estimate cancer risk, and not to any actual increase in TAC emissions or population exposure to TACs.

FIGURE 3.2-1 Cancer-Risk Weighted Toxics Trends



Source: BAAQMD, 2016

3.2.1.4.2 Air Toxics Emission Inventory

The Air District 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 Air District 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.

3.2.1.4.3 Ambient Monitoring Network

Table 3.2-6 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2017.

TABLE 3.2-6

Summary of 2017 Air District Ambient Air Toxics Monitoring Data

Compound	Max. Conc. (ppb) ⁽¹⁾	Min. Conc. (ppb) ⁽²⁾	Mean Conc. (ppb) ⁽³⁾
1,3-Butadiene	0.541	0.000	0.012
Acetaldehyde	5.680	0.480	1.982
Acetone	29.901	0.345	4.072
Acetonitrile	3.799	0.000	0.088
Acyrlonitrile	0.323	0.000	0.001
Benzene	3.123	0.000	0.221
Carbon Tetrachloride	0.130	0.024	0.098
Chloroform	0.115	0.000	0.023
Dichloromethane	1.791	0.000	0.159
Ethyl Alcohol	91.740	0.236	5.455
Ethylbenzene	1.136	0.000	0.138
Ethylene Dibromide	0.000	0.000	0.000
Ethylene Dichloride	0.000	0.000	0.000
Formaldehyde	7.290	0.480	2.707
Freon-113	0.205	0.051	0.070
Methyl Chloroform	1.226	0.000	0.006
Methyl Ethyl Ketone	5.743	0.000	0.259
Tetrachloroethylene	0.337	0.000	0.003
Toluene	3.925	0.000	0.503
Trichloroethylene	0.328	0.000	0.001
Trichlorofluoromethane	0.593	0.194	0.248
Vinyl Chloride	0.000	0.000	0.000
m/p-Xylene	2.929	0.000	0.236
o-Xylene	1.446	0.000	0.108

Source: BAAQMD, 2018a

NOTES: Table 3.2-6 summarizes the results of the Air District gaseous toxic air contaminant monitoring network for the year 2017. These data represent monitoring results at 21 separate sites at which samples were collected.

- (1) "Maximum Conc." is the highest daily concentration measured at any of the 21 monitoring sites.
- (2) "Minimum Conc." is the lowest daily concentration measured at any of the 21 monitoring sites.
- (3) "Mean Conc." is the arithmetic average of the air samples collected in 2017 at the 21 monitoring sites.
- (4) Acetaldehyde and formaldehyde concentrations reflect measurements from one monitoring site (San Jose-Jackson).

3.2.2 REGULATORY SETTING

3.2.2.1 Criteria Pollutants

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3.2-1. The federal, state, and local air quality regulations are identified below in further detail.

3.2.2.1.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for ozone, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the Air District, 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.

Other federal regulations applicable to the Bay Area include Title III of the Clean Air Act, which regulates toxic air contaminants. Title V of the Act establishes a federal permit program for large stationary emission sources. The U.S. EPA also has authority over the Prevention of Significant Deterioration (PSD) program, as well as the New Source Performance Standards (NSPS), both of which regulate stationary sources under specified conditions.

3.2.2.1.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has established National Ambient Air Quality Standards and also has

standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Federal and state air quality standards are presented in Table 3.2-1 under Air Quality Environmental Setting. California standards are generally more stringent than the National Ambient Air Quality Standards. CARB has established emission standards for vehicles sold in California and for various types of combustion equipment. CARB also sets fuel specifications to reduce vehicular emissions.

CARB released the Proposed 2016 State Strategy for the State Implementation Strategy on May 17, 2016. The measures contained in the State SIP Strategy reflect a combination of state actions, petitions for federal action, and actions for deployment of cleaner technologies in all sectors. CARB's proposed state SIP Strategy includes control measures for on-road vehicles, locomotives, ocean going vessels, and off-road equipment that are aimed at helping all districts in California to comply with federal and state ambient air quality standards.

California gasoline specifications are governed by both state and federal agencies. During the past two decades, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations in 1999, which required, among other things, that California phase out the use of MTBE in gasoline. The CARB Reformulated Gasoline Phase III regulations have been amended several times (the most recent amendments were adopted in 2013) since the original adoption by CARB.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

3.2.2.1.3 Air District Regulations

The California Legislature created the Air District in 1955. The Air District is responsible for regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The District is governed by a 24-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 District is responsible for implementing emissions standards and other requirements of federal and state laws. Numerous regulations have been developed by the District to control emissions sources within its jurisdiction. It is also responsible for developing air quality planning documents required by both federal and state laws.

Bay Area facilities 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 ROG emissions);
- Requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95 percent control of ROG 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 ROG for equipment leaks, unless those leaks are repaired within a specific timeframe; 250 ppm by volume SO₂ in exhaust gases from sulfur recovery units; 1,000 ppm by volume SO₂ 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_x 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 (H₂S) 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).
- Requiring that emissions of non-methane organic compounds and methane from the waste decomposition process at solid waste disposal sites be limited.
- Requiring emission limits on ozone precursor organic compounds from valves and flanges.
- Requiring the limitation of emissions of organic compounds from gasoline dispensing facilities.

3.2.2.2 Toxic Air Contaminants

3.2.2.2.1 Federal and State Regulations

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

Title III of the 1990 CAA amendments required the U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by the U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for affected 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 promulgated by May 2015.

Many sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed four 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), as amended by Senate Bill (SB) 1731, 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. AB2588 requires operators of certain stationary sources to inventory air toxic emissions from their operation and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (greater than 10 per million exposures or non-cancer chronic or acute hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affect individuals.

Community Air Protection Program (AB 617): The Community Air Protection Program was established under AB 617 to reduce exposure in communities most impacted by air pollution. The Program includes community air monitoring and community emissions reduction programs, as well as funding to support early actions to address localized air pollution through targeted incentive funding to deploy cleaner technologies in these impacted communities. AB 617 also includes new requirements for accelerated retrofit of pollution controls on industrial sources, increased penalty fees, and greater transparency and availability of air quality and emissions data, which will help advance air pollution control efforts. CARB is required to select the communities for action in the first year of the program and develop the program requirements by October 2018. The 2018 communities in the Bay Area recommended by CARB staff for approval by the CARB Governing Board are Richmond and West Oakland.

3.2.2.2.2 District TAC Rules and Regulations

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. 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.

District Rules and Regulations: The Air District has a number of rules that reduce or control emissions from stationary sources. A number of regulations that control criteria pollutant emissions also control TAC emissions. For example, inspection and maintenance programs for fugitive emission sources (e.g., pumps, valves, and flanges) control ROG emissions, some of which may also be TAC emissions. Also, as discussed above, the District's Rule 11-18: Reduction from Air Toxic Emissions at Existing Facilities requires a review of TAC emissions, health risk assessments for facilities that have priority scores above a certain level, and risk reduction measures or installation of Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions, if certain health risks are exceeded.

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.

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.

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 3.2-7 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 3.2-7

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

Targeted Control of TACs Under the Community Air Risk Evaluation Program: In 2004, the Air District established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, the Air District 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.

The CARE program was initiated to evaluate and reduce health risks associated with exposures to outdoor TACs and other pollutants in the Bay Area. The program examines emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The main objectives of the program are to:

- Characterize and evaluate potential cancer and non-cancer health risks associated with exposure to TACs and other pollutants from both stationary and mobile sources throughout the Bay Area.
- Assess potential exposures to sensitive populations including children, senior citizens, and people with respiratory illnesses.
- Identify significant sources of emissions and prioritize use of resources to reduce exposure in the most highly impacts areas (i.e., priority communities).
- Develop and implement mitigation measures such as grants, guidelines or regulations, to achieve cleaner air for the public and the environment, focusing initially on priority communities.

The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses

will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations.

The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities: Rule 11-18, adopted November 15, 2017, requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

A partial list of the air pollution rules and regulations that the Air District implements and enforces at Bay Area facilities 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 6, Rule 2: Miscellaneous Operations
- 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 7: Gasoline Dispensing Facilities
- 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 22: Valves and Flanges at Chemical Plants
- Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Air District Regulation 8, Rule 33: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- Air District Regulation 8, Rule 39: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- 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 7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

- 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 9, Rule 11: Nitrogen Oxides And Carbon Monoxide from Utility Electric Power Generating Boilers
- Air District Regulation 11, Rule 1: Lead
- Air District Regulation 11, Rule 8: Hexavalent Chromium
- Air District Regulation 11, Rule 18: Risk Reduction from Air Toxic Emissions at Existing Facilities
- 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 SIGNIFICANCE CRITERIA

On June 2, 2010, the District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These CEQA thresholds were designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA. The CEQA thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the Thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards.

In view of the Supreme Court's opinion, local agencies may rely on the District's CEQA thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the CEQA thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts.

The Air District published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The CEQA Guidelines for implementation of the Thresholds are for information purposes only to assist local

agencies. Recommendations in the Guidelines are advisory and should be followed by local governments at their own discretion. The Air District is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance. Since these are the most current air quality significance thresholds and address court decisions, they will be used in the CEQA analysis for the current project.

3.2.3.1 Construction Emissions

Regarding construction emissions, the Air District’s 2017 Thresholds of Significance will be used in the current air quality analysis for construction emissions (see Table 3.2-8).

TABLE 3.2-8

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NO _x	54
PM ₁₀	82*
PM _{2.5}	54*
PM ₁₀ / PM _{2.5} Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.
Source: BAAQMD, 2017a

3.2.3.2 Operational Emissions

The most recently available CEQA Guidelines established emission thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of “no net increase in emissions” is appropriate for Air Quality Plans because they include a mix of several control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The 2017 project-level stationary source CEQA thresholds are identified in Table 3.2-8. These represent the levels at which a project’s individual emissions would result in a cumulatively considerable contribution to the Air District’s existing air quality conditions for individual projects. These thresholds are based on the federal offset requirements for ozone precursors for which the Bay Area is designated as a non-attainment area, which is

an appropriate approach to prevent further deterioration of ambient air quality and thus has nexus and proportionality to prevent regionally cumulative significant impacts (e.g., worsened status of non-attainment). Despite being a non-attainment area for state PM₁₀ and pending nonattainment for federal PM_{2.5}, the federal NSR significant emission rate annual limits of 15 and 10 tons per year, respectively, are the thresholds as the District has not established an offset requirement limit for PM_{2.5} and the existing limit of 100 tons per year is much less stringent and would not be appropriate in light of the pending non-attainment designation for the federal 24-hour PM_{2.5} standards. These operational thresholds represent the emission levels above which a project’s individual emissions would result in a cumulatively considerable contribution to the Bay Area’s existing air quality conditions. The Air District is planning to develop significance thresholds specifically for rules. Until that effort is complete and in order to provide a conservative air quality analysis, the project-specific thresholds recommended in the revised 2017 CEQA Guidelines (BAAQMD, 2017) will be used in the current air quality impacts analysis (see Table 3.2-9).

TABLE 3.2-9

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NO _x	54	10
PM ₁₀	82	15
PM _{2.5}	54	10

*Source: BAAQMD, 2017a

3.2.4 ENVIRONMENTAL IMPACTS

As discussed previously, the NOP/IS (see Appendix A) found that the Expedited BARCT Implementation Schedule would require industrial facilities to install new or modify their existing air pollution control equipment. Under the Expedited BARCT Implementation Schedule, facilities that participate in the GHG Cap-and-Trade system in the Bay Area would be required to implement BARCT to reduce their criteria pollutant emissions. In the NOP/IS, air quality impacts were noted to be potentially significant and further analyzed and discussed in this section.

It is expected that the direct effects of the Expedited BARCT Implementation Schedule would be reductions in criteria pollutant and TAC emissions. However, construction equipment and activities to install air pollution control equipment has the potential to generate secondary air quality impacts, primarily from exhaust 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.

Potential secondary air quality impacts from construction activities and equipment that may be required under the Expedited BARCT Implementation Schedule are analyzed herein. The analysis identifies construction air quality impacts from air pollution control equipment that could be installed to comply with AB 617 requirements (e.g., SCRs, vapor recovery units, wet gas scrubber, etc.). Construction and operation air quality impacts are identified and provided in the following subsections.

There are a total of six rule development projects that are being evaluated under the Expedited BARCT Implementation Schedule. Of these six projects, only the Refinery Heavy Liquid Leaks project is expected to implement control measures that will have minor or no construction or operational air quality impacts.

The Refinery Heavy Liquid Leaks Project is expected to require increased LDAR in order to achieve BARCT requirements. The amendments for Regulation 8, Rule 18: Equipment Leaks have currently not been fully implemented due to litigation, making expected emissions reductions difficult to estimate. However, increase LDAR is not expected to have any air quality impacts as it would require additional monitoring of fugitive emissions and repair of equipment found to be leaking. No construction is required and LDAR does not use equipment that would contribute to air quality impacts during operation.

The overall emission benefits that are expected from the Expedited BARCT Implementation Schedule are presented in Table 3.2-10. For some of the potential rule development projects, emission reductions may be unknown at this time. For particular sources or pollutants, there may be uncertainties associated with emission estimates or the level of control and emission reductions achievable, and further study and evaluation would be required to develop more detailed estimates. For example, potential emission reductions of condensable PM are often difficult to quantify due to the complex nature of condensable PM formation. This formation can be highly dependent on site-specific source parameters, including flue gas properties and composition. Because control strategies typically involve the reduction of condensable components and precursors (such as ammonia and SO₂) instead of a direct limit on condensable PM, reductions of condensable PM emissions associated with these control measures may be difficult to estimate without specific engineering information.

TABLE 3.2-10

**Expedited BARCT Implementation Schedule Emission Reductions
Associated with Rule Development Projects**

Rule Development Project Title	Estimated Emission Reductions Criteria Air Pollutants (tons/yr)				
	ROG	CO	NOx	SOx	PM
Organic Liquid Storage Tanks ¹	75 - 125	--	--	--	--
Petroleum Wastewater Treating	Unknown ⁽²⁾	--	--	--	--
Portland Cement Manufacturing	--	--	--	698	Unknown
Refinery Fluid Catalytic Crackers and CO Boilers	--	--	--	567	Unknown
Refinery Heavy Liquid Leaks	Unknown	--	--	--	--
Petroleum Coke Calcining	--	--	Unknown	--	--

(1) The Organic Liquid Storage Tanks Project, Petroleum Wastewater Treating and Refinery Heavy Liquid Leak projects will also reduce TAC emissions. TAC emissions are not readily quantifiable and are thus not presented.

(2) For some of the potential rule development projects the estimates of emissions reductions are unknown at this time. This is due to uncertainties associated with emission estimates or the level of control and emission reductions that are achievable.

3.2.4.1 Potential Criteria Pollutant Impacts during Construction

The proposed project aims to reduce a wide variety of criteria pollutants. Different types of control technologies may need to be installed, as necessary, at affected facilities to achieve the goals of the Expedited BARCT Implementation Schedule. The potential secondary adverse air quality construction impacts from control equipment identified in Chapter 2 that may be installed to comply with the Expedited BARCT Implementation Schedule (see Table 2-4) have been analyzed in the following subsections.

The Expedited BARCT Implementation Schedule has the potential to affect industrial facilities in the Bay Area that are subject to Cap-and-Trade requirements, which include cement manufacturing facilities, refineries, and organic liquid storage facilities. Many of these facilities are expected to install various air pollution control equipment or use other means to achieve BARCT requirements.

Construction equipment associated with installing air pollution control technologies would result in ROG, NOx, SOx, CO, PM₁₀, and PM_{2.5} emissions, although the amount generated by specific types of equipment can vary greatly. As shown in Table 3.2-11, different types of equipment can generate construction emissions in much different quantities depending on the type of equipment. For example, the estimated emissions of NOx range from of

0.17 pound per hour (lb/hr) of NO_x for a forklift to 1.06 lbs/hr for a large drill rig. To provide a conservative construction air quality analysis and in the absence of information on the specific construction activities necessary to complete a construction project, a typical construction analysis assumes that, in the absence of specific information, all construction activities would occur for eight hours per day. This is considered a conservative assumption because workers may need to be briefed on daily activities, so construction may start later than their arrival times or the actual construction activities may not require eight hours to complete. However, for some construction projects, specific types of construction equipment and hours of operation have been developed using analyses prepared for other similar types of construction projects or using construction estimator guidelines used by construction contractors when bidding on jobs. As a result, under some construction scenarios hours of equipment operation may be more or less than eight hours.

TABLE 3.2-11

Emission Factors Associated with Typical Construction Equipment⁽¹⁾

Equipment Type	VOC (lb/hr)	CO (lb/hr)	NO_x (lb/hr)	SO_x (lb/hr)	PM (lb/hr)
Aerial Lift	0.00	0.17	0.10	0.00	0.00
Backhoe	0.02	0.36	0.27	0.00	0.02
Compressor	0.02	0.21	0.13	0.00	0.01
Concrete Saw	0.03	0.25	0.18	0.00	0.02
Crane	0.05	0.40	0.72	0.00	0.03
Drill Rig Large	0.08	0.50	1.06	0.00	0.04
Excavator	0.02	0.51	0.31	0.00	0.01
Forklift	0.02	0.22	0.17	0.00	0.01
Front End Loader	0.05	0.44	0.60	0.00	0.03
Generator	0.02	0.22	0.13	0.00	0.01
Light Plants	0.02	0.29	0.13	0.00	0.01
Welding Machine	0.03	0.23	0.18	0.00	0.02

(1) Emission Factors from Off-Road 2011, Model Year 2019. CO emissions from SCAQMD, 2006: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls.

A range of construction scenarios for installing various types of control equipment was identified to determine whether or not construction air quality impacts would exceed any applicable air quality significance thresholds. To provide a conservative analysis of potential construction air quality impacts, it is assumed that construction of one or more of the control technologies evaluated in the following subsections could overlap. The following subsections identify construction scenarios that may occur for control technologies and are considered to be a representative range of construction activities and equipment used to install air pollution control equipment. Construction activities range from installing or retrofitting small-scale air pollution control equipment, which would require few pieces of construction equipment or hours of operation, to installing large-scale

air pollution control technologies, which require larger construction crews, more construction equipment, and longer hours of operation. As shown in the following subsections, construction activities could result in substantial construction air quality impacts.

3.2.4.1.1 Air Pollution Control Equipment with Minor Construction Activities

Both the Organic Liquid Storage Tanks Rule Development Project and Petroleum Wastewater Treating Rule Development Project aim to reduce ROG emissions at refineries. These emission reductions are expected to be met through the installation of domes for external floating roof tanks, vapor recovery units and/or thermal incinerators for the Organic Liquid Storage Tanks Rule and through the installation of vapor combustors for the Petroleum Wastewater Treating Rule. While some vapor recovery units require less combustion than thermal incinerators or vapor combustors, any control devices with vapor combustion are evaluated together as oxidizers. All vapor recovery devices are all expected to require minor construction activities in order to install the requisite equipment.

Oxidizers

A Negative Declaration was prepared for Rule 2-5 New Source Review for Toxic Air Contaminants (SS21) which estimated the construction emissions associated with installation of oxidizers. The construction equipment that would most likely be required for the installation of a refinery oxidizer, during a peak month is provided in Table 3.2-12. This EIR assumes that each refinery would implement one vapor combustor for their respective petroleum wastewater treatment plant, resulting in a total of 5 vapor combustors for the Petroleum Wastewater Treating Rule Development Project. For the Organic Liquid Storage Tank Rule Development Project, this EIR assumes that up to 10 oxidizers may be installed. This estimate is based on the number of external floating roof tanks identified that may be subject to these BARCT requirements, and assumes that each oxidizer may be applied to multiple tanks (up to 2 tanks per oxidizer). Therefore, it is conservatively estimated that up to 15 total oxidizers could be installed in order to meet BARCT requirements; however, it is unlikely that all 15 units would be installed concurrently. This EIR assumes that a maximum of five units would share overlapping construction emissions, as shown in Table 3.2-13.

TABLE 3.2-12

Estimated Construction Equipment for Installing One Oxidizer

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoes	2	8
Cement and Mortar Mixers	1	8
Cranes	1	8
Dozers	1	8
Forklifts	1	8
Generator	1	8

Pavers	1	8
Rollers	1	8

(1) Reference: SCAQMD, 2016a

Table 3.2-13

Estimated Construction Emissions for Oxidizers

ACTIVITY	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}
Construction Emissions from Oxidizers on Refinery Units⁽¹⁾ (lbs/day)						
Construction Activities for 1 Oxidizer	0.03	0.35	0.45	0.00	0.15	0.07
Overlapping Construction Emissions for 5 Oxidizers	0.15	1.74	2.25	0.01	0.76	0.33
Total Construction Estimates for Oxidizers on Refinery Units (tons emitted during construction period – tons/yr)						
Construction Activities for 1 Oxidizer ⁽²⁾	0.000	0.004	0.005	0.000	0.002	0.001
Overlapping Construction Emissions for 5 Oxidizers	0.002	0.018	0.024	0.000	0.008	0.003

(1) Reference: SCAQMD, 2016a

(2) Construction of oxidizers is expected to take 21 working days

Domes

The Organic Liquid Storage Tanks Rule Development Project is expected to require the addition of domes to existing external floating roof tanks. A typical external floating roof tank consists of an open- topped cylindrical steel shell equipped with a roof that floats on the surface of the stored liquid. The floating roof consists of a deck, fittings, and rim seal system. External floating decks are equipped with a rim seal system, which is attached to the deck perimeter and contacts the tank wall. The purpose of the floating roof and rim seal system is to reduce evaporative loss of the stored liquid. Some annular space remains between the seal system and the tank wall. The seal system slides against the tank wall as the roof is raised and lowered. The floating deck is also equipped with fittings that penetrate the deck and serve operational functions. The external floating roof design is such that evaporative losses from the stored liquid are limited to losses from the rim seal system and deck fittings (standing storage loss) and any exposed liquid on the tank walls (withdrawal loss).

Domed floating roof tanks have the heavier type of deck used in external floating roof tanks as well as a fixed roof at the top of the shell like internal floating roof tanks. Domed external floating roof tanks usually result from retrofitting an external floating roof tank with a fixed roof. As with the internal floating roof tanks, the function of the fixed roof is not to act as a vapor barrier, but to block the wind (thus, minimizing evaporative losses). The type of fixed roof most commonly used is a self-supporting aluminum dome roof, which is of bolted construction. The estimated construction equipment needed to install one dome on

an existing refinery floating roof tank is presented in Table 3.2-14 and detailed emission calculations are provided in Appendix B. The overall estimated emissions from installing floating roof tank domes are presented in Table 3.2-15. Based on the number of external floating roof tanks identified that may be subject to these BARCT requirements, it is estimated that up to 20 dome retrofits could be installed; however, it is unlikely that all 20 units would be installed concurrently. This EIR assumes that a maximum of five units would share overlapping construction emissions.

TABLE 3.2-14

Estimated Construction Equipment for Installing One Dome

Off- Road Equipment Type	Number	Daily Hours of Use
Aerial Lift	1	8
Air Compressor	1	8
Crane	1	8
Forklift	2	8
Generator Sets	4	8
Welder	4	8

Table 3-2-15

Estimated Construction Emissions for Domes

ACTIVITY	ROG	CO	NOx	SOx	PM₁₀	PM_{2.5}
Peak Daily Emissions (lb/day)						
Construction of One Dome	2.43	24.78	23.37	0.07	2.59	1.57
Construction of Five Concurrent Domes	12.17	123.89	116.87	0.35	12.97	7.85
Peak Emissions (tons)						
Construction of One Dome	0.02	0.23	0.17	0.00	0.01	0.01
Construction of Five Dome	0.11	1.16	0.84	0.00	0.06	0.06
Construction of 20 Domes	0.43	4.64	3.35	0.01	0.25	0.22

See Appendix B for detailed emission calculations.

The Portland Cement Manufacturing Rule is expected to require additional lime injection in order to reduce PM emissions and SO₂ emissions to BARCT levels. Lime injection already occurs at the cement plant in the Bay Area that would be subject to the BARCT requirements; however, modifications to the system or additional equipment to improve, upgrade, or increase capacity of the system may be required. These may include modifications to or additional installation of storage bins, mixing tanks, and injection equipment. Construction activities would be limited and are assumed to be similar in scope to that of an oxidizer due to the limited size and nature of the additional equipment. The

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construction equipment that would most likely be required for this activity is provided in Table 3.2-16. Construction emissions are shown in Table 3.2-17.

TABLE 3.2-16

Estimated Construction Equipment for Modifying One Lime Injection System

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoes	2	8
Cement and Mortar Mixers	1	8
Cranes	1	8
Dozers	1	8
Forklifts	1	8
Generator	1	8
Pavers	1	8
Rollers	1	8

(1) Construction activity assumed to be similar to that of 1 oxidizer

Table 3.2-17

Estimated Construction Emissions for Lime Injection System Modifications

ACTIVITY	ROG	CO	NOx	SOx	PM₁₀	PM_{2.5}
Construction Emissions from Lime Injection System Modifications ⁽¹⁾ (lbs/day)						
Construction Activities for Modifications to 1 Lime Injection System	0.03	0.35	0.45	0.00	0.15	0.07
Total Construction Estimates for Lime Injection System Modifications (tons emitted during construction period – tons/yr)						
Construction Activities for Modifications to 1 Lime Injection System ⁽²⁾	0.000	0.004	0.005	0.000	0.002	0.001

(1) Construction activity assumed to be similar to that of 1 oxidizer

(2) Construction expected to take 21 working days

3.2.4.1.2 Air Pollution Control Equipment for Large Construction Activities

One of the projects under the Expedited BARCT Implementation Schedule aims to reduce PM and SO₂ emissions from refinery fluid catalytic crackers and CO boilers. These emissions reductions may be met at three different facilities using WGS and/or ESPs. Two facilities are anticipated to require controls to reduce condensable particulate matter emissions, which may require installation of either one additional ESP system or a WGS system in each facility. Another facility is anticipated to require controls to reduce both condensable particulate matter and SO₂ emissions. For this EIR, all three facilities are conservatively expected to require installation of WGS. Due to the size of a refinery FCCU, these control devices are expected to require substantial construction.

SCR is typically considered to be BACT or BARCT to reduce NO_x emissions from large industrial combustion sources; however, the affected facility may install a LoTOx™

system to further control NOx emissions. It is expected that the Petroleum Coke Calcining Rule Development Project may require the coke calciner to install one SCR or one LoTOx™ system in order to meet BARCT for NOx emissions from Bay Area coke calciners.

Wet Gas Scrubbers

WGSs have been used on large scale refinery equipment for the control of particulate matter and SO₂.

The following analysis of the construction impacts associated with installing a WGS is based on an EIR prepared for the installation of a WGS on an FCCU in southern California (SCAQMD, 2007). Because of its large size, it is expected that installing a WGS would occur over a 17-month period; one month to demolish any nearby existing equipment or structures and 16 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. As noted above, this EIR assumes that FCCUs at three facilities might be retrofitted with a WGS under the Schedule. These construction emission estimates from the SCAQMD EIR are appropriate for the construction air quality analysis for the proposed Schedule because they likewise are based on the construction of a WGS on one refinery FCCU. Regardless of the location of the construction activities, the amount or types of construction equipment and hours of operation would not be expected to differ substantially compared to the 2007 analysis. The analysis uses a conservative assumption that equipment would operate for 10 hours per day; this is consistent with the 2007 project which was on an aggressive installation schedule. The construction equipment that would most likely be required for the installation of a refinery WGS, for example, during a peak month is provided in Table 3.2-18.

TABLE 3.2-18

**Estimated Peak Day Off-Road Construction Equipment for Installing
One Refinery Wet Gas Scrubber**

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	10
Crane	3	10
Front End Loader	1	10
Man Lift	3	10
Forklift	2	10
Generator	1	10
Demolition Hammer	1	10
Welder	3	10

Reference: SCAQMD, 2007

Using worst-case assumptions derived for a WGS constructed at another refinery in California, 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, forklifts, 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), and construction worker commute trips (SCAQMD, 2007).

Based on the assumptions used for the construction of a WGS at another refinery in California, it is assumed that up to 50 construction workers would be required for demolition activities. Demolition activities are assumed to require the use of one or more of the following types of equipment: crane, front-end loader, forklift, demolition hammer, water truck, and medium-duty flatbed truck (SCAQMD, 2007). 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, fugitive dust associated with demolition activities), and construction worker commute trips.

Construction and demolition emission estimates for activities associated with installing one WGS are provided in Table 3.2-19. Typically, construction activities occur sequentially, that is, demolition must be completed before construction activities begin.

TABLE 3.2-19

Estimated Construction Emissions for a Refinery Wet Gas Scrubber

ACTIVITY	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}
Construction Emissions from one WGS on a Large Refinery Unit⁽¹⁾ (lbs/day)						
Demolition for 1 WGS at Refinery ⁽¹⁾	6	36	28	<1	3	2
Construction Activities for 1 Refinery WGS ⁽¹⁾	17	67	84	<1	39	23
Total Construction Estimates for one WGS on a Large Refinery Unit (tons emitted during construction period)						
Demolition for 1 WGS at Refinery ⁽²⁾	0.06	0.36	0.28	<0.1	0.03	0.02
Construction Activities for 1 WGS at Refinery ⁽³⁾	2.04	8.04	10.08	<0.1	4.68	2.76
Total Construction Emissions for 1 WGS ⁽³⁾	2.10	8.40	10.36	<0.1	4.71	2.78

(1) Reference: SCAQMD 2007

(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)

(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

Electrostatic Precipitators

ESPs may be installed in order to comply with the Refinery FCCU and CO Boilers Rule Development Project. ESPs used for a refinery FCCU has been previously evaluated in the ExxonMobil SCAQMD Rule 1105.1 Compliance Project (SCAQMD, 2007a). Based

on the construction information used from that project, the construction equipment that would most likely be required for the installation of a refinery ESP during a peak month is provided in Table 3.2-20 (SCAQMD, 2007a). Table 3.2-21 summarizes the peak daily construction emissions associated with the installation of a Refinery FCCU ESP. Based on the construction information used for the ESP at the ExxonMobil refinery, construction of an ESP for a refinery FCCU is expected to take approximately 14 months and would occur over four phases: site preparation and foundation laying, equipment installation, QA/QC and equipment tie-in. Peak day emission calculations assume 20 workers per day and that all deliveries would occur in one day (SCAQMD 2007a).

The construction emissions in the ExxonMobil Rule 1105.1 EIR were based on two concurrent ESPs being installed at the same facility. In order to estimate the emissions associated with the construction of one ESP, the duration of the equipment installation phase was reduced by half and recalculated with updated emission factors (see Appendix B for detailed emission calculations).

TABLE 3.2-20

Estimated Peak Day Off-Road Construction Emissions from Installing Two Refinery ESPs

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	20
Compressor	1	20
Concrete Pump Truck	1	10
Concrete Saw	1	10
Crane	1	20
Drill Rig Large	1	10
Cement Truck	10	1
Excavator	1	20
Forklift	1	20
Front End Loader	1	20
Generator	2	20
Light Plants	2	10

(1) Reference: SCAQMD 2007a

Table 3.2-21

Estimated Peak Daily Emissions from Installing ESP on a Refinery FCCU⁽¹⁾

ACTIVITY	ROG	CO	NO _x	SO _x	PM ₁₀
Construction Emissions from One ESP on a Refinery FCCU (lbs/day)					
Site Prep and Foundation	5.64	63.56	57.66	0.17	4.67
Equipment Installation	8.09	83.60	65.17	0.20	4.85
QA/QC	2.02	24.43	14.75	0.05	1.20
Tie-in	4.90	60.48	39.20	0.13	2.96
Peak Day Emissions	8.09⁽²⁾	83.60	65.17	0.20	4.85
Total Construction Estimates for ESP on a Refinery FCCU⁽³⁾ (tons emitted during construction period)					
Construction Activities for One ESP	0.96	10.56	8.42	0.03	0.71

- (1) See Appendix B for detailed emission calculations.
- (2) Highest daily emissions from the above construction phases.
- (3) Assumes 14 months of construction.

Selective Catalytic Reduction

The coke calcining facility subject to the BARCT requirements may install an SCR system to reduce NO_x emissions under the proposed project. The following analysis of the construction air quality impacts associated with installing an SCR on a coke calciner is based on an environmental analysis of the effects of further limiting NO_x emissions at southern California refineries (SCAQMD, 2015a). These construction emission estimates are appropriate for the construction air quality analysis for the Expedited BARCT Implementation Schedule because they are expected to be similar to emissions produced by the installation of an SCR used for a refinery coke calciner. Regardless of the location of the construction activities, the amount or types of construction equipment and hours of operation, these parameters would not be expected to change. Retrofitting a coke calciner with SCR is estimated to require a total of 260 days of construction, and use a crew of 140 construction workers during peak construction periods (SCAQMD, 2015a). The construction equipment that would most likely be required for installing an SCR on one coke calciner during a peak month is provided in Table 3.2-22.

The construction emission estimates for activities associated with installing one SCR on a coke calciner are provided in Table 3.2-23. Major demolition activities are not expected to be necessary to install an SCR because these units are constructed directly next to or on to the emissions sources' exhaust stacks. A maximum of one SCR is expected to be constructed as a result of the Petroleum Coke Calcining rule development project under the Expedited BARCT Schedule.

TABLE 3.2-22

Estimated Peak Day Off-Road Construction Emissions
from Installing One SCR on One Coke Calciner

Off- Road Equipment Type	Coke Calciner SCR Unit	
	Number	Daily Hours of Use
Air Compressor	1	8
Backhoe	1	8
Concrete Pump	1	2
Concrete Saw	1	2
Crane	2	10
Forklift	1	6
Generator	2	8
Man Lift	2	2
Plate Compactor	1	2
Welder	2	8

Reference: SCAQMD, 2015

TABLE 3.2-23

Estimated Construction Emissions for an SCR Unit on a Coke Calciner

ACTIVITY	ROG	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Peak Construction Emissions for One SCR Unit (lbs/day)						
Construction Activities for 1 SCR ⁽¹⁾	1.86	12.02	14.94	0	4.12	3.79
Total Construction On-road Vehicle Trips ⁽²⁾	5.22	8.58	8.60	0.71	0.47	0.22
Total Construction Emissions	7.08	20.60	23.54	0.71	4.59	4.01
Total Construction Emissions for One SCR Unit (tons emitted during construction period)						
Construction Activities for 1 SCR	0.69	3.18	3.75	0.07	0.85	0.76

Reference: SCAQMD 2015

- (1) Construction activities are estimated to occur for a total of 12 months (20 working days per month), with 6 months at peak construction activities and 6 months at 50 percent of peak construction activities.
- (2) Vehicle trip assumptions include average vehicle ridership of 1.0 and a trip length of 11 miles one way (CAPCOA, 2016).

LoTOX™ Systems

The coke calcining facility subject to the BARCT requirements may install a LoTOX™ system instead of an SCR to reduce NO_x emissions under the proposed project. LoTOX™ stands for “Low Temperature Oxidation” process in which ozone (O₃) is used to oxidize insoluble NO_x compounds into soluble NO_x compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOX™ process is a low

temperature application, optimally operating at about 325 °F. The LoTOx™ process requires equipment that is similar to a wet gas scrubber, therefore it is assumed that construction activity associated with a LoTOx™ system would be similar to construction activity associated with a refinery WGS. The expected construction equipment needed to construct a refinery LoTOx™ system is presented in Table 3.2-24; estimated construction emissions are presented in Table 3.2-25.

TABLE 3.2-24

Estimated Peak Day Off-Road Construction Equipment for Installing One LoTOX™ System

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	10
Crane	3	10
Front End Loader	1	10
Man Lift	3	10
Forklift	2	10
Generator	1	10
Demolition Hammer	1	10
Welder	3	10

Reference: SCAQMD, 2007

TABLE 3.2-25

Estimated Construction Emissions for a LoTOX™ Unit on a Refinery Coke Calciner

ACTIVITY ⁽¹⁾	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}
Peak Daily Emissions (lb/day)						
Demolition	6.00	36.00	28.00	<1	3.00	2.00
Construction	17.00	67.00	84.00	<1	39.00	23.00
Total Emissions (tons)						
Demolition ⁽²⁾	0.06	0.36	0.28	<0.1	0.03	0.02
Construction ⁽³⁾	2.04	8.04	10.08	<0.1	4.68	2.76
Total Construction Emissions	2.10	8.40	10.36	<0.1	4.71	2.78

(1) Construction activities are estimated to occur for a total of 12 months (20 working days per month), with 6 months at peak construction activities and 6 months at 50 percent of peak construction activities.

(2) Vehicle trip assumptions include average vehicle ridership of 1.0 and a trip length of 11 miles one way (CAPCOA, 2016).

3.2.4.1.3 Summary of Construction Emission Impacts

As discussed above, construction and installation of some types of air pollution control technologies would not be expected to result in significant adverse construction air quality impacts. For example, the installation of oxidizers under the Organic Liquid Storage Tanks and Refinery Wastewater Treatment Plants Rule Development Projects would result in few construction activities or related emissions. However, the construction of other equipment would require a more substantial amount of construction equipment and generate more construction emissions. Table 3.2-26 summarizes the potential construction emissions and the potential overlap of construction activities. While the actual construction activities that may occur under the Expedited BARCT Implementation Schedule may not overlap, it is reasonable to assume that there is a potential for overlap due to the process and time restraints placed by the individual rule development projects.

Based on the construction emissions in Tables 3.2-26, it is concluded that construction air quality impacts associated with ROG, NO_x, PM₁₀, and PM_{2.5} would be significant. Construction emissions, however, are temporary as construction emissions would cease following completion of construction activities. It is also worth noting that construction emissions may be less than the values shown in Table 3.2-26 depending on the equipment ultimately required to comply with BARCT. Mitigation measures for construction impacts are addressed in Section 3.2.5

TABLE 3.2-26

Worst-Case Construction Emissions Under the AB 617 BARCT Implementation Schedule

ACTIVITY	ROG	CO	NO_x	SO_x	PM₁₀	PM_{2.5}
Peak Daily Concurrent Construction Emissions (lbs/day)						
5 VRU, Incinerators, or Vapor Combustors	0.2	1.8	2.3	0.1	0.8	0.4
5 Domes	12.2	123.9	116.9	0.4	13.0	7.8
1 Lime Injection System	0.0	0.4	0.5	0.0	0.2	0.1
1 Large SCR	7.1	20.6	23.5	0.7	4.6	4.0
3 Refinery WGS	51	201	252	0.3	117	69
Total Concurrent Emissions (lbs/day)	70.5	347.7	395.2	1.5	135.6	81.3
Significance Thresholds	54	None	54	None	82	54
Significant?	Yes	--	Yes	--	Yes	Yes

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

The net effect of implementing the Expedited BARCT Implementation Schedule is to reduce TAC and criteria pollutant emissions from industrial facilities that participate in the Cap-and-Trade Program. However, some control technologies have the potential to generate secondary or indirect air quality impacts as part of the control process. Table 3.2-

27 lists all the identified air pollution control technologies that may be used to comply with future regulatory requirements under the proposed project, as well as potential secondary or indirect operational air quality impacts associated with some types of air pollution control technologies. Those air pollution control technologies in Table 3.2-27 where no direct or indirect operational air quality impacts were identified are not discussed further. The remaining air pollution control technologies that have the potential to generate secondary or indirect operational air quality impacts will be evaluated further in the following subsections.

The following analyses of potential operational secondary 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 facility is expected to be sufficient. As such, no workers' commute trip emissions are anticipated for the operation of the new or modified air pollution control equipment.

TABLE 3.2-27

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

Potential Control Technology	Potential Air Quality Impacts	Analyzed Further?
Domes on Storage Tanks	None Identified	No
Thermal Incinerator	Minor increase in combustion emissions	Yes
Vapor Combustor	Minor increase in combustion emissions	Yes
Vapor Recovery Unit	Minor increase in combustion emissions	Yes
Additional Lime Injection at Cement Plants	Minor indirect mobile source emission increases	Yes
Wet Gas Scrubbers	Minor indirect mobile source emission increases	Yes
Electrostatic Precipitator (Wet and Dry)	None identified (STAPPA /ALAPCO, 2000)	No
Increased LDAR in Heavy Liquid Service at Refineries	None Identified	No
SO ₂ Reducing Catalyst	None Identified	No
LoTOX™ at Petroleum Coke Calciners	Some ozone "slip", but reaction is rapid, impact is minor (CARB, 2005)	No
Selective Catalytic Reduction at Petroleum Coke Calciners	Ammonia slip emissions, minor indirect mobile source emission increases	Yes

3.2.4.2.1 Direct Emissions Sources

Oxidizers

Two of the rule development projects that fall under the Expedited BARCT Implementation Schedule are aimed at controlling ROG emissions from organic liquid storage tanks and petroleum wastewater treating, respectively. ROG emission reductions are expected to be met using various oxidizers, including vapor recovery units, vapor combustors, and thermal incinerators. The operation of these oxidizers will create secondary criteria pollutant emissions from combustion.

The potential air quality impacts included the emissions associated with the installation of oxidizers were previously calculated in the 2017 Clean Air Plan EIR (BAAQMD, 2017). The various control technologies aimed at controlling emissions via incineration are expected to have similar emissions. The operational emissions associated with the installation of 3.0 mm Btu/hr oxidizers are summarized in Table 3.2-28. While oxidizers may cause a small increase in criteria pollutant emissions, the Expedited BARCT Implementation Schedule will achieve an overall reduction in ROG and NO_x. The emission control devices require air permits to operate. Emissions from vapor recovery devices are generally controlled by using efficient combustion practices and enforced with permit conditions.

TABLE 3.2-28

Potential Operational Air Quality Impacts from Oxidizers

Parameter	ROG	CO⁽¹⁾	NO_x⁽²⁾	SO_x	PM₁₀	PM_{2.5}
Emission Factor ⁽³⁾	7.00	0.30	0.04	0.60	7.50	7.50
Emission Factor Units	lb/mmscf	lb/mmbtu	lb/mmbtu	lb/mmscf	lb/mmscf	lb/mmscf
Heater Duty (mmbtu/hr)	3.00	3.00	3.00	3.00	3.00	3.00
Heating Value (btu/scf)	1,050	1,050	1,050	1,050	1,050	1,050
Operational time (hr/day)	8.0	8.0	8.0	8.0	8.0	8.0
Daily Emissions for 1 Oxidizer (lb/day)	0.16	7.10	0.88	0.01	0.17	0.17
Daily Emissions for 15 Oxidizers lbs/day	2.40	106.56	13.13	0.21	2.57	2.57
Annual Emissions for 1 Oxidizer (tons/yr)	0.03	1.30	0.16	0.00	0.03	0.03
Annual Emissions for 15 Oxidizers (tons/yr)	0.44	19.45	2.40	0.04	0.47	0.47

Source: Detailed calculations can be found in BAAQMD, 2017, Appendix A.

(1) Based on 400 ppm

(2) Based on 30 ppm

(3) Default emission factors for natural gas combustion for external combustion sources. SCAQMD Annual Emissions Reporting.

3.2.4.2.2 Delivery Truck Emissions

Truck trips transporting the catalyst, caustic, lime, or ammonia solutions would occur relatively infrequently. Further, a single truck's emissions while delivering caustic solutions from San Jose to Benicia², for example, would be minimal, a few pounds per day at most. As shown in Table 3.2-29, indirect mobile source emissions from transporting delivery trucks would be low. Peak day transportation emissions assume four caustic/catalyst trucks and one lime truck (see Appendix B for detailed emission calculations). Note that the delivery truck emissions may be less than the values shown in

² 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.

Table 3.2-29, depending on the equipment ultimately required to comply with BARCT and the associated delivery of materials required. Truck trip emissions from transporting to and from industrial facilities under the Expedited BARCT Implementation Schedule would not generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

TABLE 3.2-29

Delivery Truck Emissions

Material	Truck Trips	Estimated Trip Length (mi)	Criteria Pollutant					
			CO	ROG	NOx	SOx	PM ₁₀	PM _{2.5}
Operational Emissions Per Facility (lbs/day)								
Caustic/Catalyst for 3 WGS Units	6	120	0.24	1.65	7.77	0.03	0.18	0.06
Caustic/Catalyst for LoTox Scrubber	2	120	0.08	0.55	2.59	0.01	0.06	0.02
Lime for Cement Kiln	2	100	0.07	0.46	2.16	0.01	0.05	0.01
Total Peak Daily Emissions			0.39	2.66	12.52	0.05	0.29	0.09
Operational Emissions Per Facility (Tons/year)								
Caustic/Catalyst for 3 WGS	312	120	0.03	0.03	0.21	0.03	0.06	0.03
Caustic/Catalyst for LoTox Scrubber	104	120	<0.01	0.01	0.07	<0.01	0.02	<0.01
Lime for Cement Kiln	365	100	0.01	0.04	0.20	<0.01	0.05	0.01
Total Annual Transport Emissions			0.05	0.08	0.48	0.05	0.13	0.05

Wet Gas Scrubbers

Although the main effect of installing air pollution control equipment is reducing emissions, some types of control equipment require delivery of materials that are a necessary part of the pollution control process. For example, WGS operations require a delivery of fresh catalyst and caustic solution on a daily basis. Therefore, indirect emissions occur from trucks delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis is expected.

Depending on the size and configuration of the WGS, the 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 per unit. For example, catalyst and caustic solutions are typically used in relatively small amounts per day. The use of NaOH (50 percent solution, by weight) caustic in a WGS unit could occur at facilities that already use and store NAOH caustic for other purposes, typically in one 10,000-gallon storage tank. Otherwise, the refinery operator would need to construct a new NaOH caustic storage tank and ancillary piping and other associated equipment.

Truck trips transporting the catalyst/caustic or ammonia solutions would occur relatively infrequently. Further, a single truck's emissions while delivering caustic solutions from San Jose to Benicia³, for example, would be very low, a few pounds per day at most. As shown in Table 3.2-29, indirect mobile source emissions from transporting the catalyst/caustic would be low. Truck trip emissions from transporting caustic to affected refineries that install a WGS would not generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

NOx Emission Reductions

The Petroleum Coke Calcining Rule Development Project is expected to include the installation of an SCR or a LoTOxTM system in order to best limit NOx emissions. SCRs have been used to control NOx emissions from stationary sources for many years by promoting chemical reactions in the presence of a catalyst. Installation of new SCR equipment or increasing the control efficiency of existing equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional delivery of ammonia or urea to the facilities where they are installed. It is estimated that about 40 truck trips per year would be required for the delivery of ammonia/urea. This amount could vary depending on the size of the SCR and size of the ammonia or urea storage systems. However, the 40 trucks per year is expected to provide a conservative estimate of transportation requirements. The emissions associated with these truck deliveries are included in Table 3.2-29 and are expected to be minor. Delivery truck emissions associated with the installation of a LoTOxTM system are expected to be similar to those needed for a WGS as discussed above. The emissions associated with these deliveries are also presented in Table 3.2-29.

The Petroleum Coke Calcining Project could reduce NOx by using SCR, which may potentially result in increased ammonia emissions due to "ammonia slip" (release). As a result, ammonia slip emissions could increase, thus, contributing to PM_{2.5} concentrations. Ammonia can be released in liquid form, thus, directly generating PM_{2.5} emissions. Ammonia can also be released in gaseous form where it is a precursor to PM_{2.5} emissions. Ammonia slip can increase as the catalyst ages and becomes less effective. Ammonia slip from SCR equipment is continuously monitored and controlled. The SCR technology has progressed such that ammonia slip can be limited to five parts per million (ppm) or less. SCR vendors have developed better injection systems that result in a more even distribution of NOx ahead of the catalyst so that the potential for ammonia slip has been reduced. Similarly, ammonia injection rates are more precisely controlled by model control logic units that are a combination of feed-back control and feed forward control using a proportional/integral controller that sets flow rates by predicting SCR outlet ammonia concentrations and calibrating them to a set reference value. Installation of an SCR would require an Authority to Construct from the Air District. A limit on ammonia slip is

³ 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.

normally included in air permits for stationary sources. Operators would be required to monitor ammonia slip by conducting an annual source test and maintain a continuous monitoring system to accurately indicate the ammonia-to-emitted-NO_x mole ratio at the inlet of the SCR. These measures are expected to minimize potential air quality impacts associated with ammonia slip.

Additional Lime Injection at Cement Plants

The formation of SO₂ in cement kilns is a product of the chemical make-up of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. The one cement kiln in the District currently operates a lime injection system for the control of SO₂ emissions. A hydrated lime powder is injected into the flue gas. SO₂ reacts with lime (calcium carbonate) and is captured in the baghouse as calcium sulfate. The hydrated lime usually absorbs up to 60% of the SO₂ in the gases if injected at the correct temperature.

The Portland Cement Manufacturing Rule Development Project is expected to require additional lime injection in order to meet BARCT requirements for PM and SO₂. The one facility that would require additional lime injection already has systems in place to administer lime and is not expected to require new equipment to administer additional lime that would generate substantial operational emissions. Additional lime injection will however require additional truck trips in order to deliver the lime to the facility. It is estimated that no more than one truck per day would be needed to meet the new lime demands on the facility. Thus, it is conservatively estimated that 365 truck trips per year would be required for the delivery of additional lime. The annual emissions associated with these truck deliveries are included in Table 3.2-29 and are expected to be minor.

3.2.4.2.3 Summary of Operational Emission Impacts

As shown in Table 3.2-30, the Expedited BARCT Implementation Schedule would not produce operational emissions that exceed either the Air District's daily or annual criteria pollutant significance thresholds. ROG, CO, NO_x, PM₁₀ and PM_{2.5} emissions would be less than the applicable significance threshold and, therefore, the associated impacts are concluded to be less than significant.

It should be noted that in addition to the estimated emission increases associated with the operation of new air pollution control equipment under the Expedited BARCT Implementation Schedule, reduction in air emissions would also be expected (see Table 3.2-10). Some of those reductions would be large and are included in Table 3.2-10; however, it is not possible to estimate those emission reductions for all sources, the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless the potential emission increases are expected to be either wholly or partially offset with emission decreases.

TABLE 3.2-30

**Worst-Case Operational Emissions Under the AB 617 Expedited BARCT
Implementation Schedule**

ACTIVITY	ROG	CO	NOx	SOx	PM₁₀	PM_{2.5}
Daily Concurrent Operational Emissions (lb/day)						
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6
Delivery Trucks for Caustic, Ammonia, and Lime	2.7	0.4	12.5	0.1	0.3	0.1
Total Concurrent Emissions	5.1	107.4	25.6	0.3	2.9	2.7
Reductions from Project Implementation ⁽¹⁾	411	--	--	6,932	--	--
Net Concurrent Emissions⁽²⁾	-405.9	107.4	25.6	-6,931.8	2.9	2.7
Significance Thresholds	54	None	54	None	82	54
Significant?	No	--	No	--	No	No
Annual Concurrent Operational Emissions (tons/yr)						
15 Oxidizers	0.4	19.5	2.4	<0.1	0.5	0.5
Delivery Trucks for Caustic, Ammonia, and Lime	0.1	0.1	0.5	0.1	0.1	0.1
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5
Reductions from Project Implementation	75.0	--	--	1,265.0	--	--
Net Concurrent Emissions⁽²⁾	-74.5	19.5	2.9	-1,264.9	0.6	0.5
Significance Thresholds	10	None	10	None	15	10
Significant?	No	--	No	--	No	No

(1) See Table 3.2-10. Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

3.2.4.3 Potential Toxic Air Contaminant Impacts

Table 3.2-31 shows air pollution control technologies that would be the most likely technologies installed at affected facilities under the Expedited BARCT Implementation Schedule that may have the potential to generate TAC emission impacts during operation. The subsections below evaluate those air pollution control technologies identified in Table 3.2-31 that have the potential to generate adverse TAC emission impacts. Air pollution control technologies where no direct increase or reduce operational TAC emission impacts were identified will not be discussed further.

TABLE 3.2-31

Potential TAC Impacts from Installing Air Pollution Control Equipment

Potential Control Technology	TAC Impacts
Oxidizers	Reduction in TAC emissions
Domes	Reduction in TAC emissions
Lime Injection	No increase in TAC emissions (calcium oxide)
SCR	Increase in TAC emissions (ammonia)
LoTOX™ System	Increase in TAC emissions (caustic)
WGS	Increase in TAC emissions (caustic)
ESP	Potential Increase in TAC emissions (ammonia)

3.2.4.3.1 Wet Gas and LoTOX™ Scrubbers

There are several types of caustic solutions that can be used in WGS or LoTOX™ operations, but NaOH (50 percent solution, by weight) is the one 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 typically diluted and used in small quantities, the combined filling loss and working loss would be 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 receptor would likely be far enough away that substantial dispersion of any NaOH emission would occur. Table 3.2-32 shows the level of NaOH working losses at a receptor located 25 meters from the unit.

TABLE 3.2-32

NaOH Working Losses

Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM ₁₀) Filling Loss (lb/hr)	B: Hourly NaOH (as PM ₁₀) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM ₁₀) Losses (lb/hr)	NaOH Acute Level at 25 meters (lb/hr)
3.37	7.60E-04	2.28E-03	2.28E-03	2.28E-05

See Appendix B for calculation methodology.

As indicated in Table 3.2-32, the rate of NaOH working loss emissions would be relatively low for any scrubber unit. Since it is likely that only one tank would be used to store the NaOH solution at each affected facility, working loss concentrations would not overlap. As such, even with multiple NaOH storage tanks, it is not expected that working loss

emissions would exceed the acute and chronic hazard indices. For these reasons, it is unlikely that NaOH emissions would create significant adverse acute or chronic hazard impacts to any nearby sensitive receptors. Further, there is an alternative to using NaOH as the caustic solution, sodium carbonate (Na₂CO₃) which is commonly known as soda ash, a non-toxic, non-cancerous, and nonhazardous substance.

The analysis for caustic lime would be expected to be similar as NaOH, also a caustic material. Lime is currently used at the cement plant and additional lime could be used under the Expedited BARCT requirements. Lime is not a TAC regulated by OEHHA. Therefore, the additional use of lime would not generated additional TAC emissions for the cement kiln.

3.2.4.3.2 Selective Catalytic Reduction

Unreacted ammonia emissions generated from SCR units are referred to as ammonia slip. BARCT for ammonia slip is limited to five parts per million (ppm) and enforced by a specific permit condition. Modeling has been performed that shows the concentration of ammonia at a receptor located 25 meters from a stack would be much less than one percent of the concentration at the release from the exit of the stack (SCAQMD, 2015b)⁴. Thus, the peak concentration of ammonia at a receptor located 25 meters from a stack is calculated by assuming a dispersion of one percent. While ammonia does not have an OEHHA approved cancer potency value, it does have non-carcinogenic chronic (200 µg/m³) and acute (3,200 µg/m³) reference exposure levels (RELs). Table 3.2-33 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds; both were shown to be less than significant. Therefore, non-cancer health risks would be less than the acute and chronic hazard indices and associated impacts would be less than significant. This would also be true if ammonia was used as a conditioner for an ESP.

TABLE 3.2-33

Ammonia Slip Calculation

Ammonia Slip Conc. at the Exit of the Stack, ppm ⁽¹⁾	Dispersion Factor ⁽²⁾	Molecular Weight, g/mol	Peak Conc. at a Receptor 25 m from the Stack, ug/m ³	Acute REL, ug/m ³	Chronic REL, ug/m ³	Acute Hazard Index ⁽³⁾	Chronic Hazard Index ⁽³⁾
5	0.01	17.03	35	3,200	200	0.01	0.17

- (1) Assumes ammonia slip is limited to five ppm by permitting.
- (2) Assumes that the concentration at a receptor 25 m from a stack would be much less than one percent of the concentration at the release from the exist of the stack (SCAQMD, 2015a). The dispersion factor is based on local meteorology.
- (3) Hazard index = conc. at receptor 25 m from stack, ug/m³/REL, ug/m³

⁴ It is expected that concentrations at 25 meters in the Bay Area would be comparable or less than in southern California because the different meteorological conditions in southern California compared to the Bay Area.

3.2.4.3.3 Summary of TAC Emission Impacts

In general, it should be noted that in addition to the estimated TAC emission increases associated with the operation of new air pollution control equipment, a reduction in TAC emissions would also be expected. The proposed Expedited BARCT Schedule would result in reductions in ROG associated with control on organic liquid storage tanks, petroleum wastewater treating, and fugitive emissions from heavy liquid leaks at refineries. A portion of the ROG emissions associated with ROG emissions may also be TAC emissions. OEHHA has compiled a comprehensive list of 188 chemicals that have been reported to be emitted from California refineries. The ten highest routine emissions from California refineries include ammonia, formaldehyde, methanol, sulfuric acid, hydrogen sulfide, toluene, xylenes, benzene, hexane, and hydrogen chloride. The refinery processes and equipment associated with the most chemical emissions were product loading, fluid catalytic cracking units, heaters, cokers, and vents. The chemicals released in the majority of the processes were phenol, naphthalene, benzene, and toluene (OEHHA, 2017).

OEHHA also calculated the toxicity-weighted score for refinery emissions using the emissions data (pounds emitted per year) and a toxicity weight derived from the U.S. EPA's Inhalation Toxicity Scores for individual chemicals. The chemicals emitted from refineries in California with the highest calculated toxicity-weighted emissions are: formaldehyde, nickel, arsenic, cadmium, benzene, polycyclic aromatic hydrocarbons, hexavalent chromium, benzo(a)pyrene, phenanthrene, beryllium, ammonia, 1,3-butadiene, naphthalene, hydrogen sulfide, acetaldehyde, manganese, and diethanolamine. Gases make up the majority of the routine refinery TAC emissions (OEHHA, 2017).

However, it is not possible to estimate the potential TAC emissions reductions at this point until the sources that will be controlled are known and the appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control ROG emissions as a result of the proposed project is expected to result in a reduction in TAC emissions from affected facilities. Further, the identified TAC emission increases are less than the CEQA significance thresholds. Therefore, TAC emissions associated with the proposed project are expected to result in less than significant impacts.

3.2.4.4 Conclusion

Based on the evaluation of the rule development projects associated with the Expedited BARCT Implementation Schedule and the control equipment that would likely be installed as a result of those projects, construction activities could generate NO_x, emissions that exceed the Air District's construction significance threshold. Therefore, construction air quality impacts are concluded to be significant. Impacts from the operation of air pollution control equipment and methodologies to control criteria pollutant emissions under the Expedited BARCT Implementation Schedule are expected to be less than significant for all criteria pollutant emissions. Further, TAC emissions associated with the proposed project are expected to result in less than significant impacts, with additional reductions in volatile organic TAC emissions.

Additionally, while ROG and SO_x emissions show a quantifiable benefit in Table 3.2-30, it is important to remember that the Expedited BARCT Implementation Schedule also expects to achieve NO_x, PM₁₀, PM_{2.5}, and TAC emissions reductions. While these emissions reductions are difficult to quantify, and thereby not included in Table 3.2-30, the reductions are expected to be substantial and in-line with the goals of AB 617.

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 future projects comprised of installing air pollution control equipment to reduce emissions associated with construction activities:

On-Road Mobile Sources:

A-1 Implement 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-2 Prohibit construction equipment from idling longer than five minutes at the facility under consideration as contract conditions with construction companies and by posting signs onsite.

A-3 Maintain construction equipment tuned up and with two- to four-degree retard diesel engine timing or tuned to manufacturer's recommended specifications that optimize emissions without nullifying engine warranties.

A-4 The facility operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity. Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

A-5 If cranes are required for construction, cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines shall be used. 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 NO_x control equipment. Retrofitting cranes rated 200 hp or greater with PM and NO_x 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 facility operator shall use cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines. The facility operator shall provide documentation as information becomes available that cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines are not available.

- A-6 For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the facility 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 facility operator shall use equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines. The facility operator shall provide documentation as information becomes available that equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines are not available.

3.2.5.1.1 Remaining Construction Impacts

In spite of implementing the construction air quality mitigation measures above, emissions from the construction of air pollution control equipment concurrently would be expected to continue to exceed the applicable construction air quality significance thresholds. The largest exceedance of the significance thresholds is caused by NOx emissions from construction activity. As shown in Table 3.2-34, switching from Tier 3 Blue Sky compliant equipment to Tier 4 could reduce NOx emissions by approximately 90 percent for certain equipment. In order to mitigate NOx emission related to construction activities below the significance threshold, the mitigation measures would need to achieve a reduction in NOx emissions of approximately 86 percent. Thus, the strict enforcement of the Tier 4 requirement for all construction equipment could reduce NOx emissions from construction activities to near or below the significance threshold for NOx emissions. However, the availability of Tier 4 equipment is not expected to be 100 percent because of limited inventory, which could be exacerbated by the size of the projects themselves. Further, equipment under 75 horsepower is not required to achieve NOx reductions from Tier 4 equipment. CARB's In-Use Off-Road Diesel Regulation does require fleets to include Tier 4 or retrofit engines; however, this regulation only requires that 10 percent of the fleet meet this Tier 4 standard. A higher percentage of Tier 4 construction equipment may be achievable, but would be subject to constraints of availability, demand, timing, and the need for any specialized equipment. Therefore, it is conservative to assume the mitigation measures that require the use of Tier 4 construction equipment would achieve at least approximately a 10 percent reduction in NOx emissions from construction related activities, but are not likely to achieve an 86 percent reduction in those emissions.

Table 3.2-34

Tier 4 Equipment Potential Mitigation Reductions

Horsepower	CO	HC	NOx	PM
Pre-Tier 4 Emission Factors (lb/hp-hr)				
50 - 99	3.7		3.5	0.18
100 - 174	3.7		3	0.13
175 - 300	2.6	1	3	0.09
Tier 4 Emission Factors (lb/hp-hr)				
50 - 74	3.7		3.5	0.022
75 - 175	3.7	0.14	0.3	0.015
175+	2.6	0.14	0.3	0.015
Approximate Reduction				
50 - 74	0%	NA	0%	88%
75 - 175	0%	NA	90%	88%
175+	0%	86%	90%	83%

Note:

Pre-Tier 4 assumes Blue Sky Series Engines and NMHC+NOx is all NOx.
Federal off-road diesel emission standards.

In spite of implementing the construction air quality mitigation measures above, it is concluded that the installation of two or more types of air pollution control equipment concurrently would continue to exceed the applicable construction air quality significance thresholds and, therefore, impacts from construction emissions would remain significant.

3.2.5.2 Operation Mitigation Measures

Air quality impacts during operation are expected to be less than significant; therefore, no mitigation measures are required.

3.2.6 CUMULATIVE 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)).

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 the potential overlap in construction activities for air pollution control equipment would likely exceed the applicable ROG, NO_x, PM₁₀, and PM_{2.5} 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. These thresholds represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects (BAAQMD, 2017a). Thus, the air quality impacts due to construction are considered to be cumulatively considerable for ROG, NO_x, PM₁₀, and PM_{2.5} emissions 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

As noted above, the Expedited BARCT Implementation Schedule is not expected to generate significant adverse project-specific air quality impacts and is not expected to exceed the applicable significance thresholds. These thresholds represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects (BAAQMD, 2017a). As a result, air quality impacts from the proposed project are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1). As discussed above, in addition to the estimated emission increases associated with the operation of new air pollution control equipment under the Expedited BARCT Implementation Schedule, reductions in air emissions would also be expected, some of which are potentially large. However, it is not possible to estimate all of those emission reductions at this point until the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless the potential emission increases are expected to be either wholly or partially offset with emission decreases.

As described in the EIR for the Clean Air Plan (BAAQMD, 2017), air quality within the Bay Area has improved since 1955 when the Air District was created and is projected to continue to improve. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by the Air District. This trend towards cleaner air has occurred in spite of continued population growth. The Air District is in attainment of the State and federal ambient air quality standards for CO, NO_x, and SO₂.

However, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 6 days in 2017 in the Air District, most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 8-hour standard was also exceeded on 6 days in 2017. The Air District is unclassified for the federal 24-hour PM₁₀ standard and is non-attainment with the State 24-hour PM₁₀ standard. Since the District is not in attainment for the federal and state ozone standard, the state 24-hour PM₁₀ standard, and the federal 24-hour PM_{2.5} standard, past projects and activities have contributed to the nonattainment air quality impacts that are cumulatively significant.

The 2017 Clean Air Plan contains numerous control measures that the District intends to impose to improve overall air quality in the District. Control measures in the 2017 Clean Air Plan included some of the rules in the Expedited BARCT Implementation Schedule as well as a number of other control measures to control emissions from stationary sources. The 2017 Clean Air Plan is expected to result in overall reductions in ROG, NO_x, SO_x, and PM emissions, providing an air quality benefit (BAAQMD, 2017). As reported in the Final EIR for the 2017 Clean Air Plan, large emission reductions are expected from implementation of the 2017 Plan including reductions in ROG emissions of 1,596 tons/year; NO_x emissions of 2,929 tons/year, SO_x emissions of 2,590 tons/year, and PM_{2.5} emissions of 503 tons/year (see Table 3.2-21 of the Final EIR, BAAQMD 2017). These emission reductions are expected to help the Bay Area come into compliance or attainment with the federal and state 8-hour ozone standard, the federal and state PM₁₀ standards, the federal 24-hour PM_{2.5} standards, and the state 24-hour PM_{2.5} standard, providing both air quality and public health benefits. Emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with implementation of the control measures in the 2017 Clean Air Plan, as well as emission increases from the Expedited BARCT Implementation schedule, providing a beneficial impact on air quality and public health.

3.2.6.2 Toxic Air Contaminants

It was concluded for the analysis of TAC air quality impacts, that TAC emissions from the use of ammonia and caustic, and lime (calcium carbonate) would 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. In addition, reductions in TAC emissions would be expected due to implementation of the proposed project, but those emission reductions and the related health risk benefits cannot be estimated at this time.

CHAPTER 3.3

HAZARDS AND HAZARDOUS MATERIALS

Introduction
Environmental Setting
Regulatory Setting
Significance Thresholds
Environmental Impacts
Mitigation Measures
Cumulative Impacts

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3.3 HAZARDS AND HAZARDOUS MATERIALS

This subchapter of the EIR evaluates the potential hazards and hazardous material impacts associated with the Expedited BARCT Implementation Schedule, which aims to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system.

As discussed in the Initial Study, in accordance with AB 617, the purpose of the Expedited BARCT Implementation Schedule is to implement rule development projects that utilize BARCT to reduce criteria pollutant emissions from sources participating in the GHG Cap-and-Trade system throughout the Bay Area. The NOP/IS (see Appendix A) evaluated the potential hazard and hazardous materials impacts associated with implementation of the control equipment in the proposed project. The NOP/IS determined that some control measures have the potential to create direct or indirect hazard impacts. For example, control devices may increase the hazards or releases at industrial facilities due to failure of the control equipment, which would then create an increase in potential hazard impacts in the event of an accidental release of hazardous materials into the environment. This subchapter evaluates the potential hazards and hazardous materials impacts that could result due to expedited BARCT implementation.

3.3.1 ENVIRONMENTAL SETTING

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. 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.

3.3.1.1 Hazardous Materials Incidents

The Department of Transportation, Office of Pipeline and Hazardous Materials Safety Administration (PHMSA) utilizes a post incident reporting system that collects data on incidents involving accidents. Information on accidental releases of hazardous materials are reported to PHMSA. PHMSA provides access to retrieve data from the Incident Reports Database, which also includes non-pipeline incidents, e.g., truck and rail events. Incident data and summary statistics, e.g., release date geographical location (state and county) and type of material released, are available online from the Hazmat Incident Database and are summarized in yearly incident summary reports (PHMSA, 2018).

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 the California Governor’s Office of Emergency Services (Cal OES). While information on accidental releases is reported to Cal OES, Cal OES no longer conducts statistical evaluations of the releases.

Table 3.3-1 provides a summary of the reported hazardous materials incidents in the nine counties within the Bay Area. In 2017, there were a total of 1,634 incidents reported in the nine counties regulated by the BAAQMD (see Table 3.3-1), with the most incidents (388) reported in Alameda County, followed by Contra Costa County (313).

TABLE 3.3-1

Hazardous Materials Incidents 2017 by County

COUNTY	REPORTED INCIDENTS
Alameda	388
Contra Costa	313
Marin	97
Napa	54
San Francisco	112
San Mateo	140
Santa Clara	189
Solano*	132
Sonoma*	209
Total No. of Reported Incidents	1,634

Source: OES, 2018

* Not all of Solano or Sonoma Counties are within the jurisdiction of BAAQMD

The location of the spills varies (see Table 3.3-2). In the nine counties that comprise the Air District, hazardous materials incidents during transportation, residential areas, and at waterways were the most common locations, respectively, for hazardous materials incidents. About 19 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas being the most common (38 percent), followed by waterways (28 percent).

TABLE 3.3-2

Hazardous Materials Incidents 2017

Spill Site	BAAQMD	Statewide	Percent of State Total
Waterways	250	880	28%
Transportation	463	2,956	16%
Industrial	182	480	38%
Commercial	209	1,191	18%
Residential	279	1,415	20%
Utilities	58	290	20%
Military	4	58	7%
Other	189	1,487	13%
Total	1,634	8,757	19%

Source: OES, 2018

3.3.1.2 Potential Hazards Associated with Air Pollution Control Equipment

The District has evaluated the hazards associated with the implementation of rules in previous air plans (2017 Clean Air Plan) and proposed District rules. The analyses covered a range of potential air pollution control technologies and equipment. EIRs prepared for the previous rules and air plans have specifically evaluated hazard impacts from add-on pollution control equipment. Add on pollution control technologies include scrubbers, bag filters, SCRs, vapor recovery systems, and electrostatic precipitators. The use of add-on pollution control equipment may concentrate or utilize hazardous materials. A malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The transport, use, and storage of hazardous materials are evaluated herein.

3.3.2 REGULATORY SETTING

There are many federal and state rules and regulations for handling hazardous materials, which serve to minimize the potential impacts associated with hazards.

3.3.2.1 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment from pollution into air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

3.3.2.1.1 Hazardous Materials and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA considers materials and waste to be hazardous based on four characteristics: ignitability, corrosivity, reactivity, and toxicity. Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, stricter hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA. California has been delegated authority to operate its own hazardous waste management program.

Comprehensive Environmental Response, Compensation and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

CERCLA contains prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. CERCLA also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

CERCLA also enabled the revision of the National Contingency Plan (NCP) which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List, which identifies hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program.

Prevention of Accidental Releases and Risk Management Programs: Requirements pertaining to the prevention of accidental releases are promulgated in §112 (r) of the CAA Amendments of 1990 [42 U.S.C. §7401 et. seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substances. Under these provisions, facilities that produce, process, handle or store hazardous substances have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and, 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in §112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). 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. At the local level, RMPs are implemented by the local fire departments.

3.3.2.1.2 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) is a federal law adopted by Congress in 1986 that is designed to help communities plan for emergencies involving hazardous substances. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help

increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA:

1. Emergency Planning (§§301 – 303) requires local governments to prepare chemical emergency response plans, and to review plans at least annually. These sections also require state governments to oversee and coordinate local planning efforts. Facilities that maintain Extremely Hazardous Substances (EHS) onsite (see 40 CFR Part 355 for the list of EHS chemicals) in quantities greater than corresponding “Threshold Planning Quantities” must cooperate in the preparation of the emergency plan.
2. Emergency Release Notification (§304) requires facilities to immediately report accidental releases of EHS chemicals and hazardous substances in quantities greater than corresponding Reportable Quantities (RQs) as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to state and local officials. Information about accidental chemical releases must be made available to the public.
3. Hazardous Chemical Storage Reporting (§§311 – 312) requires facilities that manufacture, process, or store designated hazardous chemicals to make Safety Data Sheets (SDSs, formerly referred to as material safety data sheets or MSDSs) describing the properties and health effects of these chemicals available to state and local officials and local fire departments. These sections also require facilities to report to state and local officials and local fire departments, inventories of all onsite chemicals for which SDSs exist. Lastly, information about chemical inventories at facilities and SDSs must be available to the public.
4. Toxic Chemical Release Inventory (§313) requires facilities to annually complete and submit a Toxic Chemical Release Inventory Form for each Toxic Release Inventory (TRI) chemical that are manufactured or otherwise used above the applicable threshold quantities.

Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires facilities to develop a Hazardous Materials Business Plan if they handle hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Hazardous Materials Business Plan is provided to state and local emergency response agencies and includes inventories of hazardous materials, an emergency plan, and implements a training program for employees.

3.3.2.1.3 Hazardous Materials Transportation Act

The Hazardous Material Transportation Act (HMTA), adopted in 1975 (see 49 U.S.C. §§5101 – 5127), gave the Secretary of Transportation the regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of

hazardous materials in commerce. The U.S. DOT (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding \$50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the U.S. DOT. The regulations cover the definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. These regulations apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Aviation Administration Office of Hazardous Materials Safety is responsible for overseeing the safe handling of hazardous materials aboard aircraft. The Federal Railroad Administration oversees the transportation of hazardous materials by rail. The U.S. Coast Guard regulates the bulk transport of hazardous materials by sea. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and issuing highway safety permits.

3.3.2.1.4 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as “any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b).” This list included all of chemical substances manufactured or imported into the U.S. prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

3.3.2.1.5 Hazardous Material Worker and Public Safety Requirements

Occupational Safety and Health Administration Regulations: The federal Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor that was created by Congress under the Occupational Safety and Health Act in 1970. OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals

in the workplace. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (see 29 CFR Part 1910). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling to protect workers who handle toxic, flammable, reactive, or explosive materials, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. For example, facilities which use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan.

Procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste are promulgated in 29 CFR Part 1910, Subpart H. Some key subsections in 29 CFR Part 1910, Subpart H are §1910.106 - Flammable Liquids and §1910.120 - Hazardous Waste Operations and Emergency Response. In particular, the Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning, for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities (see 29 CFR Part 1910 Subpart H, §1910.120 (a)(1)(i-v) and §1926.65 (a)(1)(i-v)).

Process Safety Management: As part of the numerous regulations pertaining to worker safety adopted by OSHA, specific requirements that pertain to Process Safety Management (PSM) of Highly Hazardous Chemicals were adopted in 29 CFR Part 1910 Subpart H, §1910.119 and 8 CCR §5189 to protect workers at facilities that have toxic, flammable, reactive or explosive materials. PSM program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan. Specifically, the PSM program requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on the use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

Emergency Action Plan: An Emergency Action Plan (EAP) is a written document required by OSHA standards promulgated in 29 CFR Part 1910, Subpart E, §1910.38 (a) to facilitate and organize a safe employer and employee response during workplace emergencies. An EAP is required by all that are required to have fire extinguishers. At a minimum, an EAP must include the following: 1) a means of reporting fires and other emergencies; 2) evacuation procedures and emergency escape route assignments; 3) procedures to be followed by employees who remain to operate critical plant operations before they evacuate; 4) procedures to account for all employees after an emergency evacuation has been completed; 5) rescue and medical duties for those employees who are to perform them; and, 6) names or job titles of persons who can be contacted for further information or explanation of duties under the plan.

National Fire Regulations: The National Fire Codes (NFC), Title 45, published by the National Fire Protection Association (NFPA) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards.

In addition to the NFC, the NFPA adopted a hazard rating system which is promulgated in NFPA 704 - Standard System for the Identification of the Hazards of Materials for Emergency Response. NFPA 704 is a “standard (that) provides a readily recognized, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material. It addresses the health, flammability, instability, and related hazards that may be presented as short-term, acute exposures that are most likely to occur as a result of fire, spill, or similar emergency.” In addition, the hazard ratings per NFPA 704 are used by emergency personnel to quickly and easily identify the risks posed by nearby hazardous materials in order to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response. The scale is divided into four color-coded categories, with blue indicating level of health hazard, red indicating the flammability hazard, yellow indicating the chemical reactivity, and white containing special codes for unique hazards such as corrosivity and radioactivity. Each hazard category is rated on a scale from 0 (no hazard; normal substance) to 4 (extreme risk). Table 3.3-3 summarizes what the codes mean for each hazards category.

In addition to the information in Table 3.3-3, a number of other physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, SDS lists the NFPA 704 flammability hazard ratings (e.g., NFPA 704).

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance’s fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each of these chemical characteristics.

Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark.

Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of vapor bubbles within the liquid.

TABLE 3.3-3

NFPA 704 Hazards Rating Code

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
4 = Extreme	Very short exposure could cause death or major residual injury (extreme hazard).	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Flash point below 73°F.	Readily capable of detonation or explosive decomposition at normal temperatures and pressures.	W = Reacts with water in an unusual or dangerous manner.
3 = High	Short exposure could cause serious temporary or moderate residual injury.	Liquids and solids that can be ignited under almost all ambient temperature conditions. Flash point between 73°F and 100°F.	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked.	OXY = Oxidizer
2 = Moderate	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Flash point between 100°F and 200°F.	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water.	SA = Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton, and xenon).
1 = Slight	Exposure would cause irritation with only minor residual injury.	Must be heated before ignition can occur. Flash point over 200°F.	Normally stable, but can become unstable at elevated temperatures and pressures.	Not applicable
0 = Insignificant	Poses no health hazard, no precautions necessary.	Will not burn.	Normally stable, even under fire exposure conditions, and is not reactive with water.	Not applicable

Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is represented as a unitless ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates generally have an inverse relationship to boiling points (i.e., the higher the boiling point, the lower the rate of evaporation).

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. There are different methods that can be used to determine the flashpoint of a

solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C. §1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) “Extremely Flammable” if the flash point is below 20 degrees Fahrenheit; 2) “Flammable” if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or, 3) “Combustible” if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less than 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn.

Vapor Pressure: Vapor pressure is an indicator of a chemical’s tendency to evaporate into gaseous form.

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in products, by-products and wastes. As a measure of a chemical’s potential health hazards, the following values need to be considered: the Threshold Limit Values established by the American Conference of Governmental Industrial Hygiene, OSHA’s Permissible Exposure Limits, the Immediately Dangerous to Life and Health levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council. The following is a brief description of each of these values.

Threshold Limit Values (TLVs): The TLV of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects. The TLV is an estimate based on the known toxicity in humans or animals of a given chemical substance, and the reliability and accuracy of the latest sampling and analytical methods. The TLV for chemical substances is defined as a concentration in air, typically for inhalation or skin exposure. Its units are in parts per million (ppm) for gases and in milligrams per cubic meter (mg/m³) for particulates. The TLV is a recommended guideline by the American Conference of Governmental Industrial Hygienists (ACGIH).

Permissible Exposure Limits (PEL): The PEL is a legal limit, usually expressed in ppm, established by OSHA to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower. A short-term exposure limit is one that addresses the average exposure over a 15 to 30 minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects. The OSHA PELs are published in 29 CFR 1910.1000, Table Z1.

Immediately Dangerous to Life and Health (IDLH): IDLH is an acronym defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." IDLH values are often used to guide the selection of breathing apparatus that are made available to workers or firefighters in specific situations.

3.3.2.1.6 Oil and Pipeline Regulations and Oversight

Oil Pollution Act: The Oil Pollution Act was signed into law in 1990 to give the federal government authority to better respond to oil spills. The Oil Pollution Act improved the federal government's ability to prevent and respond to oil spills, including provision of money and resources. The Oil Pollution Act establishes polluter liability, gives states enforcement rights in navigable waters of the state, mandates the development of spill control and response plans for all vessels and facilities, increases fines and enforcement mechanisms, and establishes a federal trust fund for financing clean-up.

The Oil Pollution Act also establishes the National Oil Spill Liability Trust Fund to provide financing for cases in which the responsible party is either not readily identifiable, or refuses to pay the cleanup/damage costs. In addition, the Oil Pollution Act expands provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, requiring the federal government to direct all public and private oil spill response efforts. It also requires area committees, composed of federal, state, and local government officials, to develop detailed, location-specific area contingency plans. In addition,

the Oil Pollution Act directs owners and operators of vessels, and certain facilities that pose a serious threat to the environment, to prepare their own specific facility response plans. The Oil Pollution Act increases penalties for regulatory non-compliance by responsible parties; gives the federal government broad enforcement authority; and provides individual states the authority to establish their own laws governing oil spills, prevention measures, and response methods.

Oil Pollution Prevention Regulation: In 1973, the U.S. EPA issued the Oil Pollution Prevention regulation (see 40 CFR 112), to address the oil spill prevention provisions contained in the Clean Water Act of 1972. The Spill Prevention, Control, and Countermeasure (SPCC) Rule is part of the Oil Pollution Prevention regulations (see 40 CFR Part 112, Subparts A - C). Specifically, the SPCC rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. SPCC Plans require applicable facilities to take steps to prevent oil spills including: 1) using suitable storage containers/tanks; 2) providing overfill prevention (e.g., high-level alarms); 3) providing secondary containment for bulk storage tanks; 4) providing secondary containment to catch oil spills during transfer activities; and, 5) periodically inspecting and testing pipes and containers.

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, Pipeline and Hazards Material Safety Administration, has jurisdictional responsibility for developing regulations and standards to ensure the safe and secure movement of hazardous liquid and gas pipelines under its jurisdiction in the United States. The Office of Pipeline Safety has the following key responsibilities:

- Support the operation of, and coordinate with the United States Coast Guard on the National Response Center and serve as a liaison with the Department of Homeland Security and the Federal Emergency Management Agency on matters involving pipeline safety;
- Develop and maintain partnerships with other federal, state, and local agencies, public interest groups, tribal governments, and the regulated industry and other underground utilities to address threats to pipeline integrity, service, and reliability and to share responsibility for the safety of communities;
- Administer pipeline safety regulatory programs and develops regulatory policy involving pipeline safety;
- Oversee pipeline operator implementation of risk management and risk-based programs and administer a national pipeline inspection and enforcement program;
- Provide technical and resource assistance for state pipeline safety programs to ensure oversight of intrastate pipeline systems and educational programs at the local level; and,
- Support the development and conduct of pipeline safety training programs for federal and state regulatory and compliance staff and the pipeline industry.

49 CFR Parts 178 – 185 relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 186-199 establishes minimum pipeline safety standards. The Office of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

Chemical Facility Anti-Terrorism Standards: The Federal Department of Homeland Security established the chemical facility anti-terrorism standards in 2007 (see 6 CFR Part 27). These regulations established risk-based performance standards for the security of chemical facilities and require covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement security plans.

3.3.2.2 State Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than RCRA, both the state and federal laws apply in California. The California Department of Toxic Substances Control (DTSC) is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues methods to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California under the authority of RCRA, the California Hazardous Waste Control Law, and the California Health and Safety Code. Under the direction of the CalEPA, the DTSC maintains the Cortese List and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: The California Occupational Safety and Health Administration (CalOSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- California Health and Safety Code §25270.7, §25270.8, and §25507;

- California Vehicle Code §23112.5;
- California Public Utilities Code §7673 (General Orders #22-B, 161);
- California Government Code §51018 and §8670.25.5(a);
- California Water Code §13271 and §13272; and,
- California Labor Code §6409.1(b)10.

California Accident Release Prevention (CalARP) Program: The California Accident Release Prevention Program (19 CCR Division 2, Chapter 4.5) requires the preparation of RMPs. CalARP requires stationary sources with more than a threshold quantity of a regulated substance to be evaluated to determine the potential for and impacts of accidental releases from any processes onsite (not transportation) subject to state risk management requirements. RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. The CalARP program is implemented at the local government level by Certified Unified Program Agencies (CUPAs) also known as Administering Agencies (AAs). Typically, local fire departments are the administering agencies of the CalARP program because they frequently are the first responders in the event of a release. The CalARP regulations were last updated in October 2017 to include new Program 4 requirements.

Hazardous Materials Disclosure Program: The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) as promulgated by CalEPA in CCR, Title 27, Chapter 6.11 requires the administrative consolidation of six hazardous materials and waste programs (program elements) under one agency, a CUPA. The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include Hazardous Waste Generator and Onsite Hazardous Waste Treatment Programs ("Tiered Permitting"); Above ground SPCC Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the UST Program; and the Uniform Fire Code Plans and Inventory Requirements. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Management Act: The State of California (California Health and Safety Code Division 20, Chapter 6.95) requires any business that handles more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its Certified Unified Program Agency. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years

and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the California Health and Safety Code and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the State.

California Fire Code: While NFC Standard 45 and NFPA 704 are regarded as nationally recognized standards, the California Fire Code (24 CCR) also contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

3.3.2.3 Local Regulations

Most counties in California have prepared Hazardous Waste Management Plans (HWMPs) that outlines how hazardous waste generated in the county is managed. The HWMP identifies the types and amounts of wastes generated; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated; and identifies goals, policies, and actions for achieving effective hazardous waste management

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.

3.3.3 SIGNIFICANCE CRITERIA

The impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.

- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

3.3.4 ENVIRONMENTAL IMPACTS

As discussed previously, the NOP/IS (see Appendix A) found that the Expedited BARCT Implementation Schedule would require facilities and refineries to install new or modify their existing air pollution control equipment. Under the Expedited BARCT Implementation Schedule, industrial facilities that participate in the GHG Cap-and-Trade system in the Bay Area would be required to implement BARCT to reduce their criteria pollutant emissions. Additional hazard and hazardous material impacts are expected to result from the operation of several of the possible control technologies that would most likely be used.

The Expedited BARCT Implementation Schedule is designed to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system in the Bay Area. The proposed project is not expected to require substantial new development. Any new air pollution control equipment would be expected to occur within existing commercial or industrial facilities. Facility modifications associated with the proposed project are expected to include additional lime injection at cement plants, increased LDAR in heavy liquid service at refineries, thermal incinerators, vapor combustors, vapor recovery units, the installation of SCRs, wet gas scrubbers, electrostatic precipitators, and/or LoTOXTM injection. The hazards associated with the use of these types of air pollution control equipment is summarized in Table 3.3-4 and the impacts of those with potential hazard impacts are discussed further in the subsections below.

3.3.4.1 Additional Lime Injection

3.3.4.1.1 Lime

Lime: Lime is a calcium-containing inorganic material in which oxides and hydroxides predominate. Powder hydrate lime ($\text{Ca}(\text{OH})_2$) is transported via truck to the existing cement kiln and stored in bins. Lime is mixed with water to create a slurry for use in the cement kiln for emission control. Lime is not regulated as a toxic air contaminant by OEHHA. The hazard ratings of hydrated lime are: Health is rated 3 (highly hazardous) because it can cause severe irritation or burning when it comes into contact with eyes, skin, through ingestion, or if the powder becomes airborne and is inhaled. A release would not generate a gas cloud that could migrate offsite and affect a large number of people because lime is solid at standard temperature and pressures. Rather the health hazards would be limited to the workers at the facility (cement kiln) and emergency repose individuals that may come into contact with a spill during release or clean-up activities. The use of lime would occur at an existing cement kiln than already uses, stores, and transports lime for emission control purposes and the additional use of lime is not expected to result in any new hazard impacts.

TABLE 3.3-4

Potential Hazards Impacts from Installing Air Pollution Control Equipment

Potential Control Technology	Hazards Impact	Analyzed Further?
Domes on Storage Tanks	None Identified	No
Vapor Recovery Unit	None identified	No
Thermal Incinerator	None identified	No
Vapor Combustor	None identified	No
Additional Lime Injection	Potential hazards associated with increased use of lime	Yes
Wet Gas Scrubbers	Potential hazards associated with increased use of caustic	Yes
Electrostatic Precipitator (Wet and Dry)	Potential for explosion	Yes
Increased LDAR	None Identified	No
SO ₂ Reducing Catalyst	None Identified	No
LoTOX™	Potential hazards associated with increased use of caustic or lime	No
Selective Catalytic Reduction	Potential hazards associated with increased use of ammonia	Yes

3.3.4.1 Wet Gas Scrubber

3.3.4.1.1 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 pollutant 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; it is also a noncancerous but acutely hazardous substance. Located on the SDS for NaOH (50 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous) because of its corrosivity, flammability is rated 0 (none), and reactivity is rated 1 (slightly hazardous). NaOH is considered to be hazardous for health reasons when it comes into contact with the skin, eyes or is ingested. A release of NaOH at refineries would not generate a large gas cloud that would migrate offsite and affect a large number of people. Rather the health hazards would be limited to refinery

workers and emergency response individuals that may come into contact with the spill during release or clean-up activities. Use of NaOH caustic in a WGS would occur in at refineries that already use and store NaOH caustic for other purposes and additional use of NaOH is not expected to result in any new significant impacts.

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.

3.3.4.2 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.

3.3.4.2.1 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. Although potential safety hazards exist for explosion or fire hazards associated with dry ESPs, standard industry practices and vendor safety recommendations, including frequent inspection and maintenance, air filter cleaning, use of hydrocarbon sensors, and electronic controls for process automation, are anticipated to reduce risks from operation of dry ESPs. Therefore, hazards and hazardous materials impacts from dry ESPs are concluded to be less than significant. Therefore, mitigation measures are not required.

3.3.4.2.2 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 the following 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.

3.3.4.3 Ammonia Use in SCRs

Expedited BARCT may require or encourage the use of SCR to reduce NO_x emissions at Petroleum Coke Calcining facilities. Ammonia or urea is used to react with the NO_x, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Although ammonia is currently used in SCRs throughout the Bay Area, safety hazards related to the transport, storage, and handling of ammonia exist. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM₁₀ emissions under some circumstances.

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

Installing SCRs for refinery coke calciners could lead to increased use and storage of ammonia. One coke calciner is operated by Phillips 66 in the District, located in an industrial area of the City of Rodeo. However, the use and storage of anhydrous ammonia would be expected to result in significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressure) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to concentrations of ammonia that would exceed the ERPG2 concentrations. Residential areas are located within about 2,000 feet of the Phillips 66 coke calciner

In the event of an aqueous ammonia release, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a release from onsite vessels or storage tanks, spills would be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that would evaporate, form a vapor cloud, and impact residences or other sensitive receptors in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected. Therefore, the use of aqueous ammonia is expected to be preferred over anhydrous ammonia.

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

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident spilling its contents. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the

least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

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

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

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

3.3.4.4 Releases During Transport

3.3.4.4.1 Lime

It is conservatively estimated that the cement kiln would double the amount of lime that it uses and import an additional 5,800 tons of hydrated lime per year. Each truck holds about 20 tons of lime for an estimated increase of 290 trucks per year, or an estimated one truck per day. Operators of trucks that transport hazardous materials by public highway are required to comply with requirements described in 49 CFR §§ 173 and 177 which establishes numerous requirements for the transport of hazardous materials, from the training and requirements of drivers, to the specifications and requirements of the trucks used to transport the material. Significant adverse hazards and hazardous materials impacts during use or transport of lime to a

facility or transport 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 lime would be easily contained (because it is a solid at standard temperature and pressures) and cleaned up. Based on the above information, accidental releases of lime during transport would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds.

3.3.4.4.2 Oxidation Catalyst

A typical oxidation catalyst 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 and physical properties (solid material), 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 facility 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.

3.3.4.4.3 Wet Gas Scrubber

Installation of a WGS would require deliveries of fresh caustic. 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 year¹. 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. Operators of trucks that transport hazardous materials by public highway are required to comply with requirements described in 49 CFR §§ 173 and 177. Hazardous materials impacts during the transport of NaOH caustic are considered to be less than significant.

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.

¹ 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

3.3.5 MITIGATION MEASURES

Hazards and hazardous materials impacts are expected to be less than significant; therefore, no mitigation measures are required.

3.3.6 CUMULATIVE IMPACTS

As concluded in the above hazards and hazardous materials analysis, installation of air pollution control equipment, if required in the future, is not expected to cause or contribute to significant adverse hazard or hazardous materials impacts. 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.

CHAPTER 3.4

HYDROLOGY AND WATER QUALITY

Introduction

Environmental Setting

Regulatory Setting

Significance Criteria

Hydrology and Water Quality Impacts

Mitigation Measures

Cumulative Impacts

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3.4 HYDROLOGY AND WATER QUALITY

This subchapter of the EIR evaluates the potential hazards and hazardous material impacts associated with the Expedited BARCT Implementation Schedule, which aims to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system.

As discussed in the Initial Study, in accordance with AB 617, the purpose of the Expedited BARCT Implementation Schedule is to implement several rule development projects that utilize BARCT to reduce criteria pollutant emissions from industrial sources participating in the GHG Cap-and-Trade system throughout the Bay Area. The NOP/IS concluded that certain control equipment, particularly wet gas scrubbers, could result in a substantial increase in water use or wastewater discharge.

The NOP/IS determined that the potential flooding, flood hazards and increased stormwater runoff impacts were less than significant as modifications would occur at existing facilities that have been graded and developed. Therefore, project-specific and cumulative adverse water demand and water quality impacts associated with the Expedited BARCT Implementation Schedule have been evaluated in Chapter 3.4 of this EIR. It should be noted that the NOP/IS concluded that the potential utilities and service system impacts were potentially significant due to an increase in water demand. The EIR consolidated the potential water demand impacts on both hydrology and water quality and utilities and service systems in this Subchapter 3.4

3.4.1 ENVIRONMENTAL SETTING

3.4.1.1 Regional Hydrology

The state of California is divided into ten hydrologic regions corresponding to the state's major water drainage basins. The hydrologic regions define a river basin drainage area and are used as planning boundaries, which allows consistent tracking of water runoff, and the accounting of surface water and groundwater supplies. The Air District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from southern Santa Clara County to Tomales Bay in Marin County; and inland to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level (CDWR, 2013).

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of the state's surface water from the Sierra Nevada and the Central Valley. The two major drainages, the Sacramento and San Joaquin Rivers, receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. Water from these drainages flows into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate. Nearly half of the surface water in California starts as rain or snow that falls within the watershed and flows downstream toward the Bay. Much of the water flowing toward the Bay is diverted for agricultural, residential, and

industrial purposes as well as delivery to distant cities of southern California as part of state and federal water projects (ABAG, 2017).

The two major drainages, the Sacramento and San Joaquin Rivers receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. 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 (ABAG 2017).

3.4.1.2 Surface Water Hydrology

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 through urbanization of the areas. Estuarine waters include the San Francisco Bay Delta from the Golden Gate Bridge 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. Major water bodies, including creeks and rivers, in the Bay Area are summarized in Table 3.4-1.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); and human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

TABLE 3.4-1

Watersheds of the San Francisco Bay Hydrologic Region

LOCATION	WATERSHED
North Bay	Corte Madera Creek Watershed
	Novato Creek Watershed
	Petaluma River Watershed
	Sonoma Creek Watershed
	Napa River Watershed
	Marin and North Bay Coastal Drainages ⁽¹⁾
Suisun Bay	GreenValley/Suisun Creeks watersheds
	Walnut Creek Watershed
	San Pablo/Wildcat Creeks Watersheds
	Suisun Bay Drainages ⁽²⁾
East Bay	San Leandro Creek Watershed
	San Lorenzo Creek Watershed
	Alameda Creek Watershed
	East Bay Drainages ⁽³⁾
South Bay	Coyote Creek Watershed
	Guadalupe River Watershed
	West Santa Clara Valley Drainages ⁽⁴⁾
Peninsula	San Francisquito Creek Watershed
	San Mateo Creek Watershed
	San Mateo and Peninsula Coastal Drainages ⁽⁵⁾

Source: ABAG, 2017

- (1) Including Lagunitas Creek, Arroyo Corte Madera Creek, Miller Creek, etc.
- (2) Including Sulphur Springs Creek, Laurel Creek, Mt. Diablo Creek, etc.
- (3) Including Rodeo Creek, Cordonices Creek, Claremont Creek, Peralta Creek, Lake Merritt, etc.
- (4) Including Stevens Creek, Permanente Creek, Saratoga Creek, etc.
- (5) Including Cordilleras Creek, Colma Creek, Pilarcitos Creek, Pescadero Creek, San Gregorio Creek, etc.

3.4.1.3 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, Napa-Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, Sunol 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 (ABAG, 2017).

3.4.1.4 Water Quality

The quality of regional surface water resources in the Bay Area varies considerably and is locally affected by point-source and nonpoint-source discharges throughout individual watersheds.

Regulated point sources, such as wastewater treatment effluent and industrial waste water discharges, usually involve a single point discharge into receiving waters. Point-source pollutants can also enter water bodies from urban runoff that includes oil and gasoline by-products from parking lots, streets, and freeways that are collected in drainage systems and discharged directly to surface waters. Most urban runoff flows untreated into creeks, lakes, and San Francisco Bay. This nonpoint-source runoff often carries pollutants that contribute heavy metals (and other pollutants) to local waters. Other pollutant sources include upstream historic and current mining discharges and legacy pollutants that were historically emitted by industry or other human activities, but are currently banned or significantly restricted from current usage. Examples include mercury, lead, polychlorinated biphenyls, and dichlorodiphenyltrichloroethane (ABAG, 2017).

Nonpoint-source pollutants are transported into surface waters through rainfall, air, and other pathways. The nonpoint-source pollutants originate from many diffuse sources and are the leading cause of water quality degradation in the region's waterways. Regionally, stormwater runoff is estimated to contribute more heavy metals to 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 landscaping products and bacteria from animal waste (ABAG, 2017).

In addition to the degradation of water quality in many of the region's surface waters, many of the region's creeks are channelized, culverted, or otherwise altered, which has had adverse effects on aquatic and riparian habitats, sediment transfer, and hydrology. Water quality in the more rural areas of the region has also been affected by grazing and agriculture, confined animal facilities, onsite sewage systems, and land conversions. Coastal watersheds have been impaired because of sedimentation and habitat degradation (ABAG, 2017).

The San Francisco Bay Regional Water Quality Control Board (RWQCB), the main agency charged with protecting and enhancing surface water and groundwater quality in the Bay Area, has classified the San Francisco Bay and many of its tributaries as impaired for various water quality constituents, as required by the Clean Water Act (CWA). The San Francisco RWQCB implements the Total Maximum Daily Load (TMDL) Program for impaired water bodies, which involves determining a safe level of loading for each problem pollutant, determining the pollutant sources, allocating loads to all of the sources, and implementing the load allocations. The list of impaired water bodies includes more than 270 listings in 88 water bodies. RWQCB staff are currently developing TMDL projects or studies to address more than 160 of these listings. SFBRWQCB is taking a watershed management approach to runoff source issues, including TMDL implementation, by engaging all affected stakeholders in designing and implementing goals on a watershed basis to protect water quality. Completed and current TMDL projects in the Bay Area are listed in Table 3.4-2.

TABLE 3.4-2

TMDL Projects in the Bay Area

WATER BODY	POLLUTANT
Guadalupe River Watershed	Mercury
Lagunitas Creek	Sediment
Napa River	Sediment and Pathogens
North San Francisco Bay	Selenium
San Francisco Bay Beaches	Bacteria
San Francisco Bay	Mercury and PCBs
San Vicente Creek and Fitzgerald Marine Reserve	
San Pedro Creek and Pacifica State Beach	Bacteria
Sonoma Creek	Pathogens and Sediment
Tomales Bay	Mercury and Pathogens
Urban Creeks	Pesticide Toxicity
Walker Creek	Mercury
Butano and Pescadero Creeks	Sediment
Permanente Creek	Selenium
San Francisquito Creek	Sediment
Stevens Creek	Toxicity
Suisun Marsh	Low Dissolved Oxygen, Organic Enrichment, Mercury, Nutrients, and Salinity

Source: ABAG, 2017

3.4.1.5 Water Supply and Demand

Water supply for each county is provided by its respective water supply department or agency. The following water agencies serve the majority of the water demands in the Bay Area Region:

- Alameda County Water District (ACWD)
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- City of Napa Water Department
- San Francisco Public Utilities Commission (SFPUC)
- Santa Clara Valley Water District (SCVWD)
- Solano County Water Agency (Solano CWA)
- Sonoma County Water Agency (Sonoma CW)
- Zone 7 Water Agency (Zone 7)

The Bay Area relies on imported water, local surface water, and groundwater for water supply. Local supplies account for about 31 percent of the total, and the remaining supply is imported from the State Water Project (SWP) (13 percent), Central Valley Project (CVP) (15 percent), the Mokelumne watershed (19 percent), and the Tuolumne watersheds (19 percent). Table 3.4-3 shows the projected water supplies and demands from recent urban water management plans (UWMP) for normal years in the future (2020) and over the next twenty years. All of the water districts will be able to provide adequate water supplies to meet projected demand in a year of normal precipitation, although doing so requires some districts to acquire additional supplies (ABAG, 2017).

TABLE 3.4-3
Projected Normal Year Water Supply and Demand
(acre-feet per year)

Water Agency	2020 Water Supply	2020 Demand	Future Water Supply (2040)	Future Water Demand (2040)
Alameda County WD	78,000	63,400	78,000	70,300
Contra Costa WC	329,200	264,000	362,800	303,900
East Bay Municipal Utility District	243,000	243,000	258,000	258,000
Marin Municipal WD	151,000	42,000	153,000	42,000
City of Napa	52,000	14,000	52,000	15,000
San Francisco PUC	87,000	87,000	101,000	101,000
Santa Clara Valley WD	390,000	376,000	442,000	435,000
Solano County WA ⁽¹⁾	255,000	255,000	255,000	255,000
Sonoma County WA	66,000	66,000	76,000	76,000
Zone 7 WA	79,000	72,000	100,000	93,000

Source: ABAG, 2017

(1) Future supply and demand are for the year 2030.

Some Bay Area water agencies are projecting future water supply shortfalls in dry years (including Alameda County Water District -2020, Santa Clara Valley Water District – 2040, and Sonoma County Water Agency – 2025), and some are already seeing such shortfalls (including East Bay Municipal Utility District, City of Napa Water Department, and Solano County Water Agency). Other agencies anticipate being able to handle a single dry year, largely because of reservoirs, or other storage capacity, including Contra Costa Water District, Marin Municipal Water District, San Francisco Public Utilities Commission, and Zone 7 Water Agency. The severity and timing of dry year shortfalls differ greatly among the agencies because of the wide variation of supply sources, types of use, and climates within the region. Shortages in precipitation in the Sierra Nevada can have a pronounced effect on water supply in the region than a drought in the Bay Area itself because of the reliance of the region on water from the Tuolumne and Mokelumne watersheds (ABAG, 2017).

3.4.1.6 Drinking Water Quality

Drinking water in the Bay Region ranges from high-quality Mokelumne and Tuolumne River water to variable-quality Delta water, which constitutes about one-third of the domestic water supply. Purveyors that depend on the Delta for all or part of their domestic water supply can meet drinking water standards, but still need to be concerned about microbial contamination, salinity, and organic carbon.

In 2013, the SWRCB completed a statewide report titled, “Communities that Rely on a Contaminated Groundwater Source for Drinking Water.” The report identified contaminated wells statewide that exceed a primary drinking water standard prior to any treatment or blending. In the Bay Region, 28 contaminated wells were identified that are used by 18 water systems. Most of the affected drinking water systems are small and often need financial assistance to construct a water treatment plant or another facility to meet drinking water standards. The most prevalent contaminants in the region are arsenic, nitrate, and aluminum (CDWR, 2013).

3.4.1.7 Recycled Water

In the 1990s, a number of local agencies joined with the CDWR and the United States Bureau of Water Reclamation to study the feasibility of using high-quality recycled water to augment water supplies and help the Bay-Delta ecosystem. This cooperative effort, known as the Bay Area Regional Water Recycling Program (BARWRP), produced a Master Plan for regional water recycling in 1999 for the five South Bay counties. Since then, local water agencies have built a number of projects consistent with BARWRP, and recycled water has come to be widely used in the Bay Area for a number of applications, including landscape irrigation, agricultural needs, commercial and industrial purposes, and as a supply to the area’s wetlands. In 2010, the Bay Area recycled approximately 60,000 acre-feet of water per year, almost 10 percent of the wastewater effluent generated, and supply is expected to more than double over the next 20 years (ABAG, 2017). The largest use of recycled water is for landscape irrigation, including golf courses, wetlands, industrial uses, and agricultural irrigation.

3.4.1.8 Desalination

The Alameda County Water District opened the Newark Desalination Facility in 2003, and has a capacity of 12.5 million gallons per day. The five largest water agencies in the Bay Area (SCCWD, EBMUC, SFPUC, SCVWD, and Zone 7) are currently studying the feasibility of constructing a 10 to 20 million gallon per day desalination facility in eastern Contra Costa County (ABAG, 2017).

3.4.1.9 Wastewater Treatment

Wastewater is generated by residential, commercial and industrial sources throughout the Bay Area. The Clean Water Act requires treatment of wastewater for the protection of human health and receiving water bodies and preservation of the health of aquatic and riparian species. Wastewater treatment facilities consist of staged processes with the specific treatment systems authorized through NPDES permits. Primary treatment generally consists of initial screening and clarifying. Primary clarifiers are large pools where solids in wastewater are allowed to settle out. The clarified water is pumped into secondary clarifiers and the screenings and solids are collected, processed through large digesters to break down organic contents, dried and pressed, and either

disposed of in landfills or used for beneficial agricultural applications. Secondary clarifiers repeat the process of the primary clarifiers further, refining the effluent.

Other means of secondary treatment include flocculation (adding chemicals to precipitate solids removal) and aeration (adding oxygen to accelerate breakdown of dissolved constituents). Tertiary treatment involves the removal of nutrients and nearly all suspended organic matter from wastewater, and may consist of filtration, disinfection, and reverse osmosis technologies. Chemicals are added to the wastewater during the primary and secondary treatment processes to accelerate the removal of solids and to reduce odors. Chlorine is often added to eliminate pathogens during final treatment, and sulfur dioxide is often added to remove the residual chlorine. Methane produced by the treatment processes can be used as fuel for the plant's engines and electricity needs. Recycled water must receive a minimum of tertiary treatment in compliance with DHS regulations. Water used to recharge potable groundwater supplies generally receives reverse osmosis and microfiltration prior to reuse (Water Education Foundation, 2013).

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. Treated wastewater is generally discharged into a water body, evaporation pond or percolation basin, or used recycled for agriculture, irrigation or landscaping. The U.S. EPA's NPDES permit program affects how a municipality handles its sanitary wastewater. Tertiary treatment is now commonly required for discharges to bodies of water, particularly where there is potential for human contact. Properly managed wastewater treatment systems play an important role in protecting community health and local water quality

3.4.2 REGULATORY SETTING

There are a variety of overlapping federal, state and local regulations that regulate water resources and water quality. A number of federal regulations (e.g., the Clean Water Act) are primarily implemented by state agencies with oversight from the U.S. EPA. This section summarizes the more pertinent federal, state and local regulations on water resources.

3.4.2.1 Federal Regulations

3.4.2.1.1 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into "waters of the United States." The Act specifies a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Some of these tools include:

- Section 303(d) – Total Maximum Daily Loads (TMDLs);
- Section 401 – Water Quality Certification;
- Section 402 – National Pollutant Discharge Elimination System (NPDES) Program; and
- Section 404 – Discharge of Dredge or Fill Material.

Section 303(d) – Total Maximum Daily Loads (TMDLs): The CWA §303(d) requires the SWRCB to prepare a list of impaired water bodies in the state and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality of these impaired water bodies. A TMDL is a quantitative assessment of water quality conditions, contributing sources, and the load reductions or control actions needed to restore and protect bodies of water in order to meet their beneficial uses. All sources of the pollutants that caused each body of water to be included on the list, including point sources and non-point sources, must be identified. The California §303 (d) list was completed in March 1999. On July 25, 2003, U.S. EPA gave final approval to California's 2002 revision of §303 (d) List of Water Quality Limited Segments. A priority schedule has been developed to determine TMDLs for impaired waterways. TMDL projects are in various stages throughout the District for most of the identified impaired water bodies. The Regional Water Quality Control Boards are responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

Section 401 – Water Quality Certification: The RWQCBs coordinate the State Water Quality Certification program, or CWA §401. Under CWA §401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction to ensure that the actions will be consistent with the state's water quality requirements. This program is most often associated with CWA §404 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".

Section 402 – National Pollutant Discharge Elimination System (NPDES) Program: Section 402 regulates point-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the SWRCB oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES program covers municipalities, industrial activities, and construction activities. The NPDES program includes an industrial stormwater permitting component that covers ten categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. The NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities and wastewater treatment plants. For point source discharges (e.g., wastewater treatment facilities), the RWQCBs prepare specific effluent limitations for constituents of concern such as toxic substances, total suspended solids (TSS), biochemical oxygen demand (BOD), and organic compounds.

Construction activities, also administered by the State Water Board, are discussed below under state regulations. Section 402(p) of the federal Clean Water Act, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, U.S. EPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to CWA 402(p). On May 17, 1996, U.S. EPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,

which provided guidance on permit application requirements for regulated MS4s. MS4 permits include requirements for post-construction control of stormwater runoff in what is known as Provision C.3. The goal of Provision C.3 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

3.4.2.1.2 Safe Water Drinking Act (SDWA)

Passed in 1974 and amended in 1986 and 1996, the SDWA gives the U.S. EPA the authority to set drinking water standards. Drinking water standards apply to public water systems, which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. There are two categories of drinking water standards, the National Primary Drinking Water Regulations (NPDWR) and the National Secondary Drinking Water Regulations (NSDWR). The NPDWR are legally enforceable standards that apply to public water systems. NPDWR standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water.

3.4.2.1.3 Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act, administered by United States Army Corp of Engineers (U.S. ACE), requires permits for all structures (such as riprap) and activities (such as dredging) in navigable waters of the U.S.

3.4.2.1.4 Executive Order 11990 – Protection of Wetlands

Executive Order 11990 is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. Executive Order 11990 requires that when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize impacts to wetlands resulting from such use.

3.4.2.2 State Regulations

3.4.2.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the SWRCB and divided the state into nine regions, each overseen by a RWQCB. The nine regional boards have the primary responsibility for the coordination and control of water quality within their respective jurisdictional boundaries. Under the Porter-Cologne Water Quality Control Act, water quality objectives are limits or levels of water quality constituents or characteristics established for the purpose of protecting beneficial uses. The Act requires the RWQCBs to establish water quality objectives while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Designated beneficial uses, together with the corresponding water

quality objectives, also constitute water quality standards under the federal Clean Water Act. Therefore, the water quality objectives form the regulatory references for meeting state and federal requirements for water quality control.

Each RWQCB is required to prepare and update a Basin Plan for their jurisdictional area. Pursuant to the CWA NPDES program, the RWQCB also issues permits for point source discharges that must meet the water quality objectives and must protect the beneficial uses defined in the Basin Plan.

3.4.2.2.2 Construction General Permit

The California Construction Stormwater Permit (Construction General Permit), adopted by the State Water Resources Control Board, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. Individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. Statewide general storm water NPDES permits have been developed to expedite discharge applications. They include the statewide industrial permit and the statewide construction permit. A prospective applicant may apply for coverage under one of these permits and receive Waste Discharge Requirements (WDRs) from the appropriate RWQCB. WDRs establish the permit conditions for individual dischargers. The Stormwater Rule automatically designates, as small construction activity under the NPDES stormwater permitting program, all operators of construction site activities that result in a land disturbance of equal to or greater than one and less than five acres. Site activities that disturb less than one acre are also regulated as small construction activity if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than one acre and less than five acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or U.S. EPA Region may designate construction activities disturbing less than one acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre to develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs) that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and, perform inspections and maintenance of all BMPs. Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

3.4.2.2.3 Drinking Water Standards

The California Safe Drinking Water Act, enacted in 1976, is codified in Title 22 of the CCR. The California Safe Drinking Water Act provides for the operation of public water systems and imposes various duties and responsibilities for the regulation and control of drinking water in the State of California including enforcing provisions of the federal Safe Drinking Water Act. The California Safe Drinking Water Program was originally implemented by the California Department of Public Health until July 1, 2014 when the program was transferred to the SWRCB via an act of legislation, SB 861. This transfer of authority means that the SWRCB has regulatory and enforcement authority over drinking water standards and water systems under Health and Safety Code §116271.

Potable water supply is managed through the following agencies and water districts: the California Department of Water Resources (CDWR), the California Department of Health Services (DHS), the SWRCB, the U.S. EPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights. The CDWR manages the State Water Project (SWP) and compiles planning information on water supply and water demand within the state. Primary drinking water standards are promulgated in the CWA §304 and these standards require states to ensure that potable water retailed to the public meets these standards. Standards for a total of 88 individual constituents, referred to as Maximum Contaminant Levels (MCLs), have been established under the Safe Drinking Water Act as amended in 1986 and 1996. The U.S. EPA may add additional constituents in the future. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure. State primary and secondary drinking water standards are codified in CCR Title 22 §§64431 - 64501. Secondary drinking water standards incorporate non-health risk factors including taste, odor, and appearance. The 1991 Water Recycling Act established water recycling as a priority in California. The Water Recycling Act encourages municipal wastewater treatment districts to implement recycling programs to reduce local water demands. The DHS enforces drinking water standards in California.

3.4.2.2.4 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act was enacted in September 2014. The Act provides for the management and use of groundwater in a manner that can be maintained during a 50-year planning and implementation horizon without causing undesirable results. The Act establishes a structure for locally managing California's groundwater and includes the following key elements: (1) provides for the establishment of a Groundwater Sustainability Agency; (2) requires all groundwater basins found to be of "high" or "medium" priority to prepare Groundwater Sustainability Plans (Sonoma, Napa, Solano, Contra Costa, Alameda and Control Costa Counties include basins designed as high or medium priority); (3) provides for the proposed revisions, by local agencies, to the boundaries of a basin; (4) provides authority to adopt regulations to evaluate Groundwater Sustainability Plans and review them for compliance every five years; (5) requires that Best Management Practices and technical measures be developed to implement Groundwater Sustainability Plans; and (6) provides the regulatory authority for the SWRCB to implement interim groundwater monitoring programs under certain circumstances.

3.4.2.2.5 Wastewater Treatment Regulations

The federal government enacted the CWA to regulate point source water pollutants, particularly municipal sewage and industrial discharges, to waters of the United States through the NPDES permitting program. In addition to establishing a framework for regulating water quality, the CWA authorized a multibillion dollar Clean Water Grant Program, which together with the California Clean Water Bond funding, assisted communities in constructing municipal wastewater treatment facilities. These financing measures made higher levels of wastewater treatment possible for both large and small communities throughout California, significantly improving the quality of receiving waters statewide. Wastewater treatment and water pollution control laws in California are codified in the CWC and CCR, Titles 22 and 23. In addition to federal and state restrictions on wastewater discharges, most incorporated cities in California have adopted local ordinances for wastewater treatment facilities. Local ordinances generally require treatment system designs to be reviewed and approved by the local agency prior to construction. Larger urban areas with elaborate infrastructure in place would generally prefer new developments to hook into the existing system rather than construct new wastewater treatment facilities. Other communities promote individual septic systems to avoid construction of potentially growth accommodating treatment facilities. The RWQCBs generally delegate management responsibilities of septic systems to local jurisdictions. Regulation of wastewater treatment includes the disposal and reuse of biosolids.

3.4.2.2.6 California Department of Fish and Wildlife

The California Department of Fish and Wildlife is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify the Department of any proposed activity that may substantially modify a river, stream, or lake. The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water.

3.4.2.3 Local Regulations

3.4.2.3.1 McAteer-Petris Act/San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act is a provision under California law that preserves San Francisco Bay from indiscriminate filling. The Act established the San Francisco Bay Conservation and Development Commission (BCDC) as the agency charged with preparing a plan for the long-term use of the Bay and regulating development in and around the Bay while the plan was being prepared. The San Francisco Bay Plan, completed in January 1969, includes policies on 18 issues critical to the wise use of the bay, ranging from ports and public access to design considerations and weather. The McAteer-Petris Act authorizes BCDC to incorporate the policies of the Bay Plan into state law. The Bay Plan has two features: policies to guide future uses of the bay and shoreline, and maps that apply these policies to the bay and shoreline. BCDC conducts the regulatory process in accordance with the Bay Plan policies and maps, which guide the protection and development of the bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline.

3.4.2.3.2 General Plan Elements

The conservation, open space and safety elements are the most relevant of the general plan elements to hydrology and water quality. The conservation element typically addresses watershed protection, land or water reclamation, prevention or control of the pollution of streams and other coastal waters, regulation of land uses along stream channels and in other areas required to implement the conservation plan (e.g., buffer areas), to control or correct soil erosion, and for flood control. The open space element applies to the preservation of natural resources, including fish and wildlife habitat, rivers, streams, bays and estuaries, and open space.

3.4.2.3.3 Other Local Regulations

In addition to federal and state regulations, cities, counties and water districts may also provide regulatory advisement regarding water resources. Many jurisdictions incorporate policies related to water resources in their municipal codes, development standards, storm water pollution prevention requirements, and other regulations.

3.4.3 SIGNIFICANCE CRITERIA

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

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 263,000 gallons per day of potable water.

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.

3.4.4 ENVIRONMENTAL IMPACTS

Under the Expedited BARCT Implementation Schedule, industrial sources that participate in the GHG Cap-and-Trade system in the Bay Area would be required to expedited BARCT to reduce criteria pollutant emissions. As discussed in the NOP/IS (see Appendix A), 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 3.4-3).

3.4.4.1 Potential Water Demand Impacts

It is expected that affected industrial facilities would install new or modify existing air pollution control equipment to comply with the Expedited BARCT Implementation Schedule. Most air pollution control equipment does not use water or generate wastewater (see Table 3.4-4). However, additional water demand and wastewater generation impacts are expected to result from the operation of wet gas scrubbers (or LoTOX), which may be used to control refinery FCCUs and coke calciners, and water usage to make the lime slurry to control emissions from the cement kiln (see Table 3.4-4).

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. Potential water demand and water quality impacts during potential future construction activities will be evaluated in the subsections below.

Table 3.4-4 shows air pollution control equipment that are expected to be required under the Expedited BARCT Implementation Schedule. As shown in Table 3.4-4, 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, which includes domes on storage tanks, increased LDAR, and SO₂ Reducing Catalysts, 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.

3.4.4.1.1 Dust Suppression Associated with Construction Activities

Installation of some types of relatively small air pollution control equipment, e.g., thermal incinerators, vapor recovery units and vapor combustors, are not expected to require site preparation activities because the equipment is generally not very large and could often be constructed onto existing 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 thermal incinerators, vapor combustors, or vapor recovery units.

TABLE 3.4-4

Potential Control Technologies and Potential Water Use and Wastewater Generation during Equipment Operations

Potential Control Technology	Uses Water?	Exceeds threshold?	Generates Wastewater?	Exceeds Threshold?
Domes on Storage Tanks	No	No	No	No
Vapor Recovery Unit	No	No	No	No
Thermal Incinerator	No	No	No	No
Vapor Combustor	No	No	No	No
Additional Lime Injection	Yes	No	No	No
Wet Gas Scrubbers	Yes	Yes	Yes	No
Electrostatic Precipitator (Dry)	No	No	No	No
Electrostatic Precipitator (Wet)	Yes	No	Yes	No
Increased LDAR	No	No	No	No
SO ₂ Reducing Catalyst	No	No	No	No
LoTOX™	Yes	Yes	Yes	No
Selective Catalytic Reduction	No	No	No	No

For larger air pollution control equipment, e.g., ESPs, WGSs (including LoTOx) and SCRs, site preparation activities requiring water for dust control would likely be necessary. 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. A WGS is one of the largest types of potential air pollution control equipment that could be installed as part of the Expedited BARCT Implementation Schedule. A typical WGS 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 each affected facility. Installation of the controls required under the Schedule might include large construction projects that involve site preparation activities requiring water for dust control, such as construction of LoTOx or SCR at the coke calciner; ESPs or WGS units at two refinery FCCUs for reducing particulate matter emissions; and a WGS at a third refinery FCCU for reducing particulate matter and SO₂ emissions. Table 3.4-5 summarizes the potential water demand associated with the potential overlap of site preparation/earth moving activities. While the actual construction and site preparation/earth moving activities that may occur under the Expedited BARCT Implementation Schedule may not overlap, it is reasonable to assume that there is a potential for overlap due to the process and time

restraints placed by the individual rule development projects. As shown, even in the unlikely event that site preparation/earth moving activities for four construction projects were to coincide and each use water simultaneously, an estimated 48,000 gallons per day of water would be expected to be used for dust suppression activities, which would be less than the significance threshold for water demand. This analysis assumes that all water used for dust suppression activities is potable water. It is likely that the 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.

TABLE 3.4-5

Estimated Water Use During Construction of Control Equipment

Air Pollution Control Equipment	Estimated Size of Grading (sq ft)	Estimated Water Needed for Dust Suppression (gal/day)
Individual Refinery WGS, LoTOx, SCR, or ESP (1 Unit)	6,000	12,000
Potential Overlapping Site Preparation/Earth Moving Activities		
Refinery WGS or ESP (3 Units)	18,000	36,000
Coke calciner SCR (1 Unit)	6,000	12,000
Total	-	48,000
Significance Threshold	-	263,000
Significant?	-	No

3.4.4.1.2 Operation

Additional Lime Injection

Hydrated lime is mixed with water to create a slurry for use in the cement kiln for emission control. It is assumed that the cement kiln will use a 25 percent hydrated lime solution, the same concentration that is currently used at the facility; however, increased lime injection will be used to remove SO₂ emissions. The use of approximately 5,800 tons per year of lime, would result in the increased use of 4,752,000 gallons per year or approximately 13,000 gallons per day. The water use for the existing lime injection system is from the plant’s reclaimed water system. It is expected that some or all of the increase in water use for the increase in lime injection would come from the reclaimed water system as well; however, for this EIR, it is conservatively assumed that the increase in water use is potable water.

Wet Electrostatic Precipitator

Installation of ESPs may occur under the Expedited BARCT Implementation Schedule. ESPs could be used to control PM emissions from FCCUs. Dry ESPs require no water, while wet ESP use water spray/mist to entrain the particulates and remove them from the gas stream.

The SCAQMD required additional control of particulates from FCCUs at refineries in southern California. All refineries installed new dry ESPs or upgraded existing dry ESPs, and one refinery

installed a WGS and wet ESP to comply with SCAQMD Rule 1105.1. Wet ESPs are used in situations for which dry ESPs are not suited, such as when the material to be collected is wet, sticky, flammable, explosive, or has high resistivity (U.S. EPA, 2018). The use of dry ESPs would not require water usage. The use of wet ESPs would require additional water, which is used as part of the emission control process. Instead of potable water, it is likely that each affected refinery operator would utilize strip sour water or similar existing treated waste process water from elsewhere within each refinery. Because existing sources of wastewater, e.g., strip 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, 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 ESPs on future water demand at an affected facility are not expected to exceed any applicable water demand significance thresholds because dry ESPs are more likely to be utilized.

Wet Gas Scrubber – Operation

One wet ESP and WGS were installed on the FCCU at the Phillips 66 Los Angeles Refinery to control sulfur oxide emissions, as well as PM₁₀ and PM_{2.5} emissions. The environmental analysis for this project indicated that the expected water demand associated with the WGS was about 300 gallons per minute (432,000 gallons per day) (SCAQMD, 2007). WGS systems of this size are primarily designed for large emission sources (e.g., refineries and other large manufacturing facilities). The water demand from LoTOx, which operates similar to a wet scrubber, is expected to be similar to a WGS. The water demand from one new WGS of this size would exceed the CEQA significance threshold for water demand of 263,000 gallons per day. District staff has estimated that up to three WGS systems, one LoTOx system, and additional lime injection may be implemented to comply with the Expedited BARCT Implementation Schedule. If all three WGS are required, along with one LoTOx unit and additional lime injection, the total water usage is estimated to be up to 1,741,000 gal/day, as summarized in Table 3.4-6. Therefore, operational impacts to water demand are considered to be significant.

TABLE 3.4-6

Estimated Operational Water Use of Expedited BARCT Implementation Schedule

Equipment	Estimated Operational Water Use (gal/day)
Refinery WGS (3 Units)	1,296,000
Coke Calciner LoTOX	432,000
Cement Kiln Lime Injection	13,000 ⁽¹⁾
Maximum Daily Water Usage	1,741,000
Significance Threshold	263,000
Significant?	Yes

(1) A portion of this water is expected to be reclaimed water.

Conclusion

Based upon the above considerations, water demand impacts from installing three WGS on refinery FCCUs, a LoTOX on a coke calciner, and additional lime injection at a cement kiln may exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant.

3.4.4.2 Potential Water Quality Impacts

Increased demand for water from the various control technologies generally will be proportional to any increases in wastewater generation from affected facilities; however, there are a number of factors that affect wastewater generation. As with quantifying water demand, there is insufficient information available to calculate the volumes of wastewater from control equipment for the following reasons. First, not all of the additional water demand generated by installing air pollution control equipment would ultimately be discharged as wastewater. In some control systems, a portion of the increased water demand would be emitted as steam or would evaporate during the control process. To determine this evaporation rate, it is necessary to know the operating temperature and humidity in the vicinity of the equipment, 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.

3.4.4.2.1 Construction Activities

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 runoff from dust suppression activities would not be expected to occur and water quality impacts from dust suppression activities are concluded to be less than significant.

3.4.4.2.2 Operation

Since additional water would be needed as part of certain types of air pollution control equipment, the proposed project could increase the wastewater generated by each affected facility. The cement kiln uses lime injection in the form of lime slurry, where powder hydrated lime is mixed with water to create a 25 percent hydrated lime solution. The slurry is sprayed together with the conditioning water into the kiln's exhaust flue gas. The water in the hydrated lime slurry is then evaporated by the hot gases. Therefore, the water used to make the slurry is not expected to result in any additional wastewater discharges because the water is evaporated in the kilns.

Wastewater from WGS, ESP, and LoTOx systems is collected and flows into a sump where it is typically treated. The wastewater is treated in the facility's wastewater treatment plant and then discharged or recycled to minimize the water demand and wastewater generated from the equipment.

Depending on the facility's wastewater treatment system, the effluent may be further treated and discharged to the sanitary sewer system. WGS, ESP, and LoTOx systems would be used on

FCCUs or coke calciners, which currently have wastewater discharges and wastewater treatment systems. Depending on the type of WGS or LoTOx, some water may be lost as steam. For these reasons, it is not expected that wastewater would exceed a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Refineries are large users of water, have large wastewater discharges, and have large wastewater treatment facilities. 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. Wastewater discharges from an industrial facility would be required to be discharged in compliance with applicable wastewater discharge permits. Therefore, water quality impacts from the operation of WGS, ESP, and LoTOx systems are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during operation are concluded to be less than significant.

Once recycled, wastewater generated by the WGS, ESP, and LoTOx systems can also be returned to the equipment for reuse, which would reduce the total amount of water required for air pollution control, as well as the amount of wastewater discharged into the sewer system.

3.4.4.3 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.

3.4.5 MITIGATION MEASURES

3.4.5.1 Water Demand

Because it was concluded that if wet gas scrubbers, additional lime injection, and LoTOx systems are installed as a response to the Expedited BARCT Implementation Schedule, potential future water demand impacts from the proposed systems during operation would be significant, mitigation measures for water demand are required. Therefore, for any affected facility 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 facility is required to use recirculated, reclaimed, or recycled water, if available, to satisfy the water demand for the air pollution control equipment.

HWQ-2 In the event that reclaimed or recycled water cannot be delivered to the affected facility, the facility 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 reclaimed or recycled water cannot be supplied to the project.

3.4.5.2 Remaining Impacts

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 facilities and because of the prevalence of drought conditions in California. The use of recirculated, reclaimed, or recycled water may be able to reduce water demand from these control systems, however, the availability and feasibility of procuring and using these water sources in the future is not currently known, and would be dependent on the individual equipment design and site-specific considerations of water availability. Therefore, impacts associated with the proposed project will remain significant after mitigation for water demand.

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

3.4.6 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 for these environmental topic areas.

In the above analysis of water demand impacts from the proposed project during operation it was concluded that installing WGS, additional lime injection, and LoTOx systems has the potential to generate significant adverse operational water demand impacts. Therefore, operational water demand impacts during operation of the proposed project are considered to be cumulatively considerable for the Expedited BARCT Implementation Schedule (CEQA Guidelines §15064 (h)(1)).

CHAPTER 3.5

OTHER CEQA SECTIONS

**Growth Inducing Impacts
Significant Environmental Effects Which
Cannot Be Avoided And Significant
Irreversible Environmental Changes
Potential Environmental Impacts Found
Not to be Significant**

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3.5 OTHER CEQA SECTIONS

3.5.1 GROWTH INDUCING IMPACTS

3.5.1.1 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;
- 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.

3.5.1.2 Economic and Population Growth, and Related Public Services

The Expedited BARCT Implementation Schedule would not directly foster economic or population growth or the construction of new housing in the Bay area. The Expedited BARCT Implementation Schedule may require construction of air pollution control equipment or operational measures/modifications within the confines of the existing industrial facilities but would not be expected to involve new development outside of existing facilities. 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 rule amendments would not remove barriers to population growth, as it involves no changes to General Plan, zoning ordinance, or related land use policy. The proposed rule amendments do not include the development of new housing or population-generating uses or infrastructure that would directly

encourage such uses. Therefore, the Expedited BARCT Implementation Schedule would not directly or indirectly trigger new residential development in the District.

Further, the Expedited BARCT Implementation Schedule 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 project would not result in an increase in permanent workers or residents. Additional workers would be limited to temporary construction workers. Likewise, the proposed project 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 project would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

3.5.1.3 Removal of Obstacles to Growth

The Expedited BARCT Implementation Schedule 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, such as wastewater treatment facilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the Expedited BARCT Implementation Schedule 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.

3.5.1.4 Development of Encroachment 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 Expedited BARCT Implementation Schedule may require additional air pollution control equipment and measures within the confines of existing facilities and existing industrial areas. New development outside of the boundaries of industrial facilities is not expected to occur. Therefore, the proposed rule amendments would not result in development within or encroachment into an open space area.

3.5.1.5 Precedent Setting Action

The Expedited BARCT Implementation Schedule would lead to further control of criteria pollutant emissions. The type of control equipment that would be implemented as part of the proposed project (e.g., SCRs, ESPs, thermal oxidizers, WGS, etc.) has been used and proven to be effective at other industrial facilities. Requiring technologies and measures that have been demonstrated to be effective to control air emissions from the affected industrial facilities would not result in precedent-setting actions that might cause significant environmental impacts.

3.5.1.6 Conclusion

The Expedited BARCT Implementation Schedule 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.

3.5.2 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 rule amendments would result in potentially significant unavoidable impacts as identified in Table 3.5-1.

TABLE 3.5-1

IMPACTS IDENTIFIED AS POTENTIALLY SIGNIFICANT IN THIS EIR FOR IMPLEMENTATION OF THE EXPEDITED BARCT IMPLEMENTATION SCHEDULE

POTENTIALLY SIGNIFICANT IMPACTS
ROG, NO _x , PM ₁₀ , and PM _{2.5} Emission Impacts During Construction
Water Demand Impacts

3.5.3 POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the Expedited BARCT Implementation Schedule that may have potentially significant adverse effects on the environment are identified, evaluated, 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 (§§15126(a) and 15126.2). The potentially significant adverse environmental impacts as determined by the Initial Study (see Appendix A) are: air quality, hazards and hazardous materials, hydrology and water quality, and utilities and service systems. The water demand impacts were determined to be significant under hydrology/water quality and utilities/services. To avoid repetition, the water demand impacts have been consolidated under the hydrology and water quality impacts section in Chapter 3.4 of this EIR. The analysis provided in the Initial Study has concluded that impacts on the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources; biological resources; cultural resources; geology and soils; greenhouse gas emissions, land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation and traffic; tribal cultural resources; and utilities and service systems. The reasons for finding impacts to the environmental resources to be less than significant are explained in the following subsections, which are summarized from the NOP/IS (see Appendix A) unless otherwise noted.

3.5.3.1 Aesthetics

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. Some BARCT measures are not expected to be visible outside of the existing facility. This would include covering portions of petroleum wastewater treatment

facilities, lime injection at cement plants, use of SO₂ reducing catalysts, and increased LDAR.

Other BARCT measures would include the installation of equipment that may be visible outside of the existing industrial facilities, however, these facilities are located in industrial areas which do not have scenic views or scenic resources. For example, domes on storage tanks increase the height of the storage tanks making them more visible to the areas surrounding the storage tanks. However, storage tanks are generally located at refineries, bulk handling and storage facilities, or manufacturing facilities and are located within industrial areas. Thus, they are not expected to have significant adverse aesthetic impacts to the surrounding community. Additionally, new air pollution control equipment is not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts.

The industrial facilities affected by the Expedited BARCT Implementation Schedule may need to install or modify air pollution control equipment to reduce criteria pollutant emissions from their facilities. These facilities are existing industrial facilities that currently operate or can operate 24 hours a day and have existing lighting for nighttime operations. For example, refineries operate continuously 24 hours per day, 7 days per week and are already lighted for nighttime operations. The same is true for most other types of manufacturing operations. Therefore, the Expedited BARCT Implementation Schedule is not expected to require any additional lighting to be installed as a result of new air pollution control equipment or control measures. New light sources, if any, would be located in industrial areas and 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 Expedited BARCT Implementation Schedule is not expected to have significant adverse aesthetic impacts to the surrounding community.

3.5.3.2 Agriculture and Forestry Resources

Physical modifications at facilities due to the proposed project are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. This equipment would be compatible with the existing industrial character of the area and would not be located in agricultural or forestland areas. Thus, no impacts to agriculture and forestry resources are expected.

The proposed project would not conflict with existing agriculture related zoning designations or Williamson Act contracts. Existing agriculture and forest resources within the boundaries of the Air District are not expected to be affected by the construction of additional air pollution control equipment or modification to existing emission sources. Therefore, there is no potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract, or impacts to forestland resources.

3.5.3.3 Biological Resources

Physical modifications at facilities due to the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to

existing industrial structures. These facilities have been built and graded and no major grading would be expected to occur due to the installment of additional air pollution control equipment. Construction activities would occur within industrial areas, where native biological resources have been removed or are non-existent. Thus, the proposed project is not expected to result in any impacts to biological resources.

The proposed project is 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 Expedited BARCT Implementation Schedule is not expected to affect any habitat conservation or natural community conservation plans, biological resources or operations, and would not create divisions in any existing communities, as construction activities would be limited to existing facilities in industrial areas that have already been developed and graded.

3.5.3.4 Cultural Resources

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The Expedited BARCT Implementation Schedule would result in control measures and new air pollution control equipment to be constructed within the confines of the existing industrial facilities and adjacent to existing industrial structures. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3). Further, construction activities associated with the proposed project are expected to be limited to industrial areas that have already been developed. Thus, the Expedited BARCT Implementation Schedule would not adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries. Therefore, no impacts to cultural resources are anticipated to occur as a result of the proposed project as no major construction activities are required.

3.5.3.5 Geology and Soils

Physical modifications at facilities due to the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. New development potentially resulting in earthquake hazards are expected to be limited to the construction of air pollution control equipment or measures at industrial facilities. New construction (including modifications to existing structures) requires compliance with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code bases 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.

Construction associated with the proposed project is expected to be limited to air pollution control equipment at industrial facilities. All construction would take place at already existing facilities that have been previously graded. Thus, the proposed project is not expected to result in substantial soil erosion or the loss of topsoil as construction activities are expected to be limited to existing operating facilities that have been graded and development, so that no major grading would be required.

3.5.3.6 Greenhouse Gas Emissions

While the primary purpose of the Expedited BARCT Implementation Schedule is to reduce emissions of ROG, NO_x, SO₂, and PM, some types of control equipment have the potential to create secondary adverse air quality impacts and create GHG emissions, through construction activities or through the additional of air pollution control equipment. The Expedited BARCT Implementation Schedule may result in the installation of new equipment at facilities that need to comply with the new requirements.

Limited construction activities may be required under the Expedited BARCT Implementation Schedule to enclose open fugitive components, install new catalyst, install lime injection systems, and so forth. Construction emissions associated with this type of construction would be minor and would involve the transport of the new equipment which is expected to require one to two truck trips. Installation of the equipment would be expected to be limited to one to two workers and would not require any major construction equipment and no site preparation activities are expected to be required. Therefore, retrofitting this type of existing equipment would result in minor construction emissions.

Construction activities would also be required for the construction of new air pollution control equipment at existing facilities, including vapor combustors, wet gas scrubbers, selective catalytic reduction, ESPs, vapor recovery systems, and LoTOX systems. The equipment associated with the Expedited BARCT Implementation Schedule would be required at existing facilities with large emission sources, e.g., refinery FCCUs. Construction activities for these types of new air pollution control equipment would be temporary. Each of these sources that might be subject to the Expedited BARCT Implementation are subject to the Cap-and-Trade Program and its greenhouse gas emissions are required to comply with the requirements of the Cap-and-Trade Programs. As a result, the greenhouse gas emission impacts resulting from the Expedited BARCT Implementation Schedule will be less than significant, since these emissions are part of a state plan aimed at reducing GHG emissions.

The facilities affected by the Expedited BARCT Implementation Schedule could require the installation of additional air pollution control equipment or the implementation of new measures to control criteria pollutants. These measures could generate additional GHG emissions. However, the facilities subject to the Expedited BARCT Implementation Schedule must comply with the Cap and Trade Program, a requirement that the Expedited BARCT Implementation

Schedule will not change. The Expedited BARCT Implementation Schedule will therefore have a less than significant impact on GHG emissions.

3.5.3.7 Land Use and Planning

Physical modifications at facilities due to the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Thus, the proposed project is not expected to have impacts to non-industrial land uses and would not result in impacts that would physically divide an established community.

The General Plans and land use plans for areas with industrial land uses, generally 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 refineries (Benicia, 2015 and Santa Clara, 2011). The construction of equipment within the confines of existing facilities is not expected to conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the affected industrial facilities. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The construction required as part of the proposed project would not interfere with those land use policies or objectives.

The proposed project has no components which would affect land use plans, policies, or regulations. Regulating emissions from existing facilities will not require local governments to alter land use and other planning considerations. Habitat conservation or natural community conservation plans, agricultural resources or operations, would not be affected by the proposed project, and divisions of existing communities would not occur. Therefore, current or planned land uses within the District will not be significantly affected as a result of the proposed project.

3.5.3.8 Mineral Resources

Construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Construction of air pollution control equipment and modifications to existing industrial facilities as a result of the proposed project is not expected to affect mineral resources. Construction and operation of new equipment associated with proposed project is not expected to require mineral resources that are of value to the region or result in the loss of a locally important mineral resource site. Thus, no significant adverse impacts to mineral resources are expected.

3.5.3.9 Noise

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial

structures. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. Construction required for the installation of air pollution control equipment or facility modifications is not expected to significantly alter the existing noise of an industrial facility. Construction activities associated with the proposed project would generate temporary noise associated with construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities would be temporary, would occur during daylight hours, and would occur within the confines of existing industrial facilities so that no significant increase in noise during construction activities is expected.

Air pollution control equipment is not generally a major noise source. The equipment would be located within heavy industrial areas and compatible with such uses. Further, all noise producing equipment must comply with local noise ordinances and applicable OSHA and Cal/OSHA noise requirements. Therefore, industrial operations affected by the Expedited BARCT Implementation Schedule are not expected to have a significant adverse effect on local noise levels or noise ordinances.

The proposed project is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. The use of large construction equipment that would generate substantial noise or vibration (e.g., backhoes, graders, jackhammers, etc.) would be limited because the sites are already graded and developed. Further, construction activities are temporary and would occur during the daylight hours, in compliance with local noise standards and ordinances. Therefore, the proposed project is not expected to generate excessive groundborne vibration or noise.

Affected facilities would still be expected to comply, and not interfere, with any applicable airport land use plans. None of the Expedited BARCT Implementation Schedule requirements would locate residents or commercial buildings or other sensitive noise sources closer to airport operations. There are no components of the Expedited BARCT Implementation Schedule that would substantially increase ambient noise levels within or adjacent to airports. Therefore, these topics will not be further evaluated in the EIR.

3.5.3.10 Population and Housing

The population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). 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 project will require construction activities to modify existing operations and/or install air pollution control equipment at existing industrial facilities. It is expected that the existing labor pool would accommodate the labor requirements for the construction of the new and modified industrial equipment. In addition, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment. In the event that 1-2 new employees are hired, the existing local labor pool in the District (over seven million people) can accommodate any increase in demand for workers that

might occur as a result of adopting the Expedited BARCT Implementation Schedule. The proposed project is not expected to result in the creation of any industry/business 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.

3.5.3.11 Public Services

There is no potential for adverse public service impacts as a result of adopting the Expedited BARCT Implementation Schedule as it would not result in the need for new or physically altered government facilities to maintain acceptable service ratios, response times, or other performance objectives. Additionally, most of the affected refineries have on site security and fire protection personnel, so no increase in police or fire protection services is expected. Implementing the proposed rule would not cause a future population increase, thus it is not expected to affect land use plans, future development, or the demand for public facilities such as schools and parks.

3.5.3.12 Recreation

As discussed under “Land Use and Planning” and “Population and Housing,” there are no provisions of the proposed project that would affect land use plans, policies, ordinances, or regulations as land use and other planning considerations are determined by local governments. No land use or planning requirements, including those relating to recreational facilities, will be altered by the proposed rule amendments. The proposed project does not have the potential to directly or indirectly induce population growth or redistribution. As a result, the proposed project would not increase the use of, or demand for, existing neighborhood or regional parks or other recreational facilities nor require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

3.5.3.13 Transportation and Traffic

Physical modifications at facilities due the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial structures.

Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities and related traffic would be temporary, would occur during daylight hours, would occur within the confines of existing industrial facilities, and would cease following the completion of construction. As discussed in “Population and Housing” above, the labor force in the Bay Area is sufficient to handle the temporary increase in construction-related jobs. No increase in permanent workers is expected due to the installation of additional air pollution control equipment or facility modifications. The installation of some air pollution control equipment, e.g., SCRs and wet gas scrubbers, could result in an increase of about 1-2 trucks per week to deliver ammonia, catalyst or caustic materials to the facilities for the operation of the equipment. The increase in one truck per day would be a negligible increase in traffic in the Bay Area.

The proposed project is not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths, as no increase in permanent workers is expected. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways are expected. No changes are expected to parking capacity at or in the vicinity of affected facilities as the proposed project only pertain to equipment located within existing industrial facilities. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

The Expedited BARCT Implementation Schedule is not expected to: (1) involve the delivery of materials via air so no increase in air traffic is expected or change air traffic patterns; (2) create traffic hazards or create incompatible uses; (3) impact emergency access at industrial facilities affected by the proposed project, as no modifications that effect traffic or access are expected to be required; (4) increase vehicle trips or to alter the existing long-term circulation patterns, thus creating traffic hazards; (5) affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths as construction is expected to be limited to existing industrial facilities; (6) result in an increase in permanent workers; or (7) conflict with any congestion management programs or other plans, increase travel demand, impact public transit, or impact bicycle or pedestrian safety. Therefore, no impacts resulting in changes to traffic patterns or adopted traffic plans or programs are expected.

3.5.3.14 Tribal Cultural Resources

The proposed Expedited BARCT Implementation Schedule may require the construction of air pollution control equipment and facility modifications to industrial facilities. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3), are not listed or eligible for listing in the California Register of Historic Resources or a local register of historical resources (Public Resources Code Section 5020.1(k), and are not considered to have cultural value to a California Native American tribe.

Construction associated with the proposed project is expected to be limited to the construction at industrial facilities. All construction would take place at existing facilities that have been previously graded. Because construction will be limited to facilities that have been graded, the Expedited BARCT Implementation Schedule is not expected to require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. The Expedited BARCT Implementation Schedule is not expected to result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources.

As part of releasing the NOP/IS for public review and comment, the document was circulated to the State Clearinghouse that provides notice of the proposed project to all California Native American Tribes that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code § 21080.3.1(b)(1). The NAHC notification list provides a 30-day period during which a Native American Tribes may respond to the notice, in writing,

requesting consultation on the Expedited BARCT Implementation Schedule. No tribes have requested consultation.

Since construction activities will be limited to existing industrial facilities, the Expedited BARCT Implementation Schedule is not expected to affect historical or tribal resources as defined in Public Resources Section 5020.1(k), or 5024.1. Therefore, no impacts to tribal resources are anticipated to occur as a result of the proposed project.

3.5.3.15 Utilities and Service Systems

The potential water use and wastewater impacts associated with the Expedited BARCT Implementation Schedule were discussed under Hydrology and Water Quality.

Air pollution control equipment and facility modifications to implement the Expedited BARCT Implementation Schedule would occur within the confines of existing industrial facilities where stormwater is already controlled. The proposed project is not expected to require additional paving that would generate additional stormwater runoff. Therefore, the proposed project would not be expected to alter the existing drainage systems or require the construction of new storm water drainage facilities. Nor would the proposed project 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.

Construction of air pollution control equipment as a result of the Expedited BARCT Implementation Schedule is not expected to significantly increase solid or hazardous wastes generated by the affected existing facilities. Some air pollution control equipment uses catalysts that need to be replaced when it is depleted. The catalyst is usually recycled because of the metal content of the catalyst and would not be expected to generate additional hazardous or solid waste that requires disposal. Waste streams from affected facilities would be treated/disposed/recycled in the same manner as they currently are handled. Therefore, no significant impacts to hazardous or solid waste disposal facilities are expected due to the proposed project. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

While potential electricity and natural gas impacts were not discussed in the NOP/IS, this EIR provides a discussion of potential electricity and natural gas impacts. The California Energy Commission tracks both electricity and natural gas consumption for the state of California. A summary of the annual consumption of both electricity and natural gas is provided below in Table 3.5-2.

Table 3.5-2

Bay Area Natural Gas and Electricity Consumption, 2016⁽¹⁾

County	Electricity (million kWh)	Natural Gas Use (million therms)
Alameda	10815	361
Contra Costa	9644	1136
Marin	1343	66
Napa	1058	36
San Francisco	5759	227
San Mateo	4340	200
Santa Clara	16777	421
Solano	3207	254
Sonoma	2965	106
Total	55907	2807

(1) CEC, 2018

A number of the rule development projects under the Expedited BARCT Implementation Schedule would require electricity as part of installing or modifying existing air pollution control equipment. Electricity could be utilized to operate certain construction equipment in lieu of diesel, such as welders and temporary lights, if electricity is available. Any additional electricity that may be needed as part of construction activities associated with the proposed project would typically be supplied by the local electrical utility; however, the majority of construction equipment is diesel-powered and does not require electricity. Thus, electricity use during construction activities would be minor.

Implementation of the Expedited BARCT Implementation Schedule would result in the installation of air pollution control equipment that would increase electricity use during operation. Table 3.5-3 provides estimates of electricity demand associated with the operation of the air pollution control equipment that would be expected as a result of the Expedited BARCT Implementation Schedule. Note that because ESPs have a higher electricity demand than WGS, ESP electricity demand was considered for this analysis to provide a conservative estimate.

Overall the electricity demand created by the proposed project is expected to be able to be met by local suppliers or the facility themselves as a number of refineries operate their own cogeneration units. The electricity would be used to further control emissions of criteria pollutants and assist the District in complying with ambient air quality standards; therefore, the electricity would not be used in a wasteful or inefficient manner. Thus, it is concluded the Expedited BARCT Implementation Schedule will not have a significant impact on electricity or use electricity in a wasteful manner.

Table 3.5-3

Annual Electricity Use of Air Pollution Control Equipment Associated with the Expedited BARCT Implementation Schedule

Control Equipment	Number of Units	Potential Increased Electricity Demand (MWhr/day)	Potential Increased Electricity Demand (Million kWh/yr)
WGS ⁽¹⁾	1	261	95.3
LoTox Scrubber ⁽²⁾	1	261	95.3
SCR ⁽²⁾	1	222	81.0
ESP ⁽³⁾	2	803	293.1
Total		1547	564.7

(1) SCAQMD, 2007

(2) SCAQMD, 2015

(3) SCAQMD, 2007a

Of the air pollution control equipment that would be installed as a result of the Expedited BARCT Implementation Schedule, only vapor combustors, thermal incinerators, and vapor recovery units, collectively referred to as oxidizers, are expected to require the use of natural gas. The natural gas usage for one oxidizer is expected to be approximately 75 mmscf/yr. With a heating value of 1,050 mmbtu/scf and a total of 15 oxidizers expected to be installed as a result of the Expedited BARCT Implementation Schedule, the total natural gas usage is expected to be approximately 118 million therms/yr.

Overall, the natural gas use associated with the proposed project is expected to be met by local suppliers or the facility themselves as refineries general refinery fuel gas, which can be used in place of natural gas. The natural gas would be used to further control emissions of criteria pollutants and assist the District in complying with ambient air quality standards; therefore, the natural gas would not be used in a wasteful or inefficient manner. Thus, it is concluded the Expedited BARCT Implementation Schedule will not have a significant impact on natural gas or use natural gas in a wasteful manner.

CHAPTER 4

ALTERNATIVES ANALYSIS

Discussion of Alternatives
Description of Alternatives
Environmental Impacts of Project Alternatives
Conclusion
Comparison of Alternatives

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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 significant impacts to air quality (ROG, NO_x, PM₁₀, and PM_{2.5}) during construction activities and water demand associated with the operation of potential air pollution control equipment (WGS, LoTOX, and lime injection) associated with the Expedited BARCT Implementation Schedule. Therefore, alternatives analysis should focus on alternatives that avoid or minimize these potentially significant impacts. The project objectives are as follows:

1. Implement and/or install best available retrofit control technologies on industrial sources subject to CARB's Cap-and-Trade program, as defined by the AB 617 requirements;
2. Reduce criteria pollutant emissions from significant industrial sources that participate in CARB's Cap-and-Trade program;
3. Lessen the burden of air quality impacts on communities that suffer a disproportionate burden from air pollution; and
4. Comply with the requirements of AB 617.

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.

Alternatives that consider other rule development projects were rejected as infeasible because they would not be compliant or achieve the goals of AB 617. AB 617 requires air districts to review the emissions control technology installed on pollution sources located at industrial facilities subject to the Cap-and-Trade program. The schedule must give priority to any sources that have not had emissions limits modified for the greatest period of time. The schedule does not apply to sources that have implemented BARCT since 2007. No other rule development projects were identified that would comply with these requirements.

4.2 DESCRIPTION OF THE PROJECT ALTERNATIVES

The possible alternatives to the Expedited BARCT Implementation Schedule are limited by the nature of the project. Other than the No Project Alternative, the other alternative is limited to adjusting the timeline of the implementation schedule. This is because of the conditions imposed by AB 617, which define the scope and timeline of the project. Therefore, the alternatives will be limited to delaying the Expedited BARCT Implementation Schedule to its maximum extent while still complying with AB 617 (except for the No Project Alternative).

4.2.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

CEQA Guidelines §151216.6 (e) requires evaluation of a “No Project Alternative.” Under the No Project Alternative, the Expedited BARCT Implementation Schedule would not be implemented. There would be no rule development activity for new rules or rule amendments to:

- Reduce ROG emissions from Organic Liquid Storage Tanks;
- Reduce ROG emissions associated with refinery wastewater treatment systems;
- Reduce PM and SO₂ emissions from Portland cement manufacturing;
- Reduce PM and SO₂ emissions from Refinery Fluid Catalytic Cracking Units and CO gas boilers;
- Reduce ROG emissions from fugitive heavy liquid leaks; and
- Reduce NO_x emissions from petroleum coke calcining operations.

Under Alternative 1, no additional air pollution control equipment or measures (e.g., monitoring/repair of fugitive heavy liquid leaks) would be implemented. Alternative 1 would not comply with AB 617, which requires air districts to address industrial Cap-and-Trade facilities that do not have BARCT in place and adopt an Expedited BARCT Implementation Schedule. Therefore, Alternative 1 would not comply with the AB 617 requirements. Per CEQA Guidelines §15364, “feasible” “means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” Alternative 1 would not comply with the AB 617 requirements and would not be considered feasible at this time.

It should be noted that it would be unlikely that the District would remain out of compliance with AB 617 indefinitely and some action would likely be taken in the future to comply. Nonetheless, for the purpose of comparison and public disclosure, it will be assumed that no action will be taken under the No Project Alternative.

4.2.2 ALTERNATIVE 2 – BARCT DELAYED IMPLEMENTATION

AB 617 requires each air district that is in nonattainment for one or more air pollutants to adopt an expedited schedule for implementation of BARCT by the earliest feasible date, but no later than December 31, 2023. The Expedited BARCT Implementation Schedule is shown in Table 4.2-1 and shows that the applicable rules would be amended or adopted by third quarter of 2021. Alternative 2 would delay the Expedited BARCT Implementation Schedule so that all rules would not be implemented until 2023, which is the deadline for implementing monitoring and air pollution controls measures required under AB 617 (see Table 4.2-2). Therefore, the overlap of construction activities would be expected to be reduced; however, there will be a loss of operational emissions benefits (emissions reductions) for several years as compared to the proposed project.

TABLE 4.2-1

Proposed Project - Expedited BARCT Implementation Schedule

Rule Development Project	Pollutants Addressed	Anticipated Development Schedule	2018	2019	2020	2021
Organic Liquid Storage Tanks	ROG	Q4 2018 – Q1 2020				
Petroleum Wastewater Treating	ROG	Q1 2019 – Q3 2020				
Portland Cement Manufacturing	PM, SO ₂	Q2 2019 – Q2 2021				
Refinery Fluid Catalytic Crackers and CO Boilers	PM, SO ₂	Q1 2019 – Q4 2020				
Refinery Heavy Liquids Leaks	ROG	Q1 2019 – Q4 2019				
Petroleum Coke Calcining	NOx	Q3 2020 – Q3 2021				

TABLE 4.2-2

Alternative 2 – Delayed BARCT Implementation Schedule

Rule Development Project	Pollutants Addressed	Anticipated Development Schedule	2018	2019	2020	2021	2022	2023
Organic Liquid Storage Tanks	ROG	Q3 2019 – Q4 2020						
Petroleum Wastewater Treating	ROG	Q3 2020 – Q2 2022						
Portland Cement Manufacturing	PM, SO ₂	Q1 2020 – Q2 2022						
Refinery Fluid Catalytic Crackers and CO Boilers	PM, SO ₂	Q3 2020 – Q4 2022						
Refinery Heavy Liquids Leaks	ROG	Q3 2019 – Q2 2020						
Petroleum Coke Calcining	NOx	Q1 2023 – Q4 2023						

4.3 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES

4.3.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

4.3.1.1 Air Quality

Under Alternative 1, the Expedited BARCT Implementation Schedule would not be implemented. Therefore, no construction emissions are expected under the No Project Alternative. As shown in Table 3.2-26, the worst-case construction schedule for the proposed project would be expected to result in ROG, NO_x, PM₁₀, and PM_{2.5} emissions that would exceed significance thresholds. Therefore, the Expedited BARCT Implementation Schedule would result in significant air quality impacts during construction activities, which would also be cumulatively considerable. The significant construction air quality impacts would be eliminated under Alternative 1.

The operational air quality impacts associated with the proposed project were determined to be less than significant. Impacts from the potential increase in operational emissions, including emissions from truck traffic, were determined to be less than significant. Nonetheless, they would be eliminated under Alternative 1.

The overall emission benefits that are expected from the proposed project are presented in Table 4.3-1. For some of the potential rule development projects, emission reductions may be unknown at this time but would nonetheless be expected to occur. Under Alternative 1, the beneficial impacts associated with ROG emission reductions (75 to 125 tons per year) and SO_x emissions reductions (1,265 tons per year) would also not occur.

Impacts from the potential increase in TAC emissions associated with the proposed project were also determined to be less than significant. Further, the proposed project is expected to result in a beneficial reduction in TAC emissions, as well, as criteria pollutants. However, it is not possible to estimate the potential TAC emissions reductions at this point until appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control measures to control ROG emissions (e.g., domes on tanks and additional ROG monitoring on fugitive components in heavy liquid service) as a result of the proposed project is expected to result in a reduction in TAC emissions from affected facilities. The potential TAC emissions reductions under the proposed project would be eliminated under Alternative 1.

TABLE 4.3-1

**Expedited BARCT Implementation Schedule Emission Reductions
Associated with Rule Development Projects**

Rule Development Project Title	Estimated Emission Reductions Criteria Air Pollutants (tons/yr)				
	ROG	CO	NOx	SOx	PM
Organic Liquid Storage Tanks ¹	75 - 125	--	--	--	--
Petroleum Wastewater Treating	Unknown ⁽²⁾	--	--	--	--
Portland Cement Manufacturing	--	--	--	698	Unknown
Refinery Fluid Catalytic Crackers and CO Boilers	--	--	--	567	Unknown
Refinery Heavy Liquid Leaks	Unknown	--	--	--	--
Petroleum Coke Calcining	--	--	Unknown	--	--

(1) The Organic Liquid Storage Tanks Project, Petroleum Wastewater Treating and Refinery Heavy Liquid Leak projects will also reduce TAC emissions. TAC emissions are not readily quantifiable and are thus not presented.

(2) For some of the potential rule development projects the estimates of emissions reductions are unknown at this time. This is due to uncertainties associated with emission estimates or the level of control and emission reductions that are achievable.

4.3.1.2 Hazards and Hazardous Materials

The hazard impacts associated with the installation of air pollution control equipment under the Expedited BARCT Implementation Schedule are expected to be less than significant. Under Alternative 1, none of the potential rules or rule amendments associated with the Expedited BARCT Implementation would occur at this time and the impacts from related hazards, including transport of materials, use of hazardous materials, and hazards associated with air pollution control equipment would remain less than significant.

4.3.1.2 Hydrology and Water Quality

Water demand impacts from operating WGS systems at refinery FCCUs, additional lime injection at a cement kiln, and a LoTOx at a coke calciner may exceed applicable water demand significance thresholds and, therefore, water demand impacts associated with the proposed project were concluded to be significant after mitigation and cumulatively considerable. Under Alternative 1, no additional air pollution control equipment would be installed at this time; therefore, no significant or cumulatively considerable impacts associated with water demand would be expected.

Under the proposed project, 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, were concluded to be less than significant. Under Alternative 1 no additional air pollution control equipment would be installed at this time; therefore, no increase in wastewater would occur and the impacts on wastewater generation and water quality would remain less than significant.

4.3.2 ALTERNATIVE 2 – DELAYED BARCT IMPLEMENTATION

4.3.2.1 Air Quality

Under Alternative 2, the Expedited BARCT Implementation Schedule would be delayed until 2023. Under Alternative 2, all of the proposed BARCT rule development projects would be implemented, but would be implemented at a slower pace. As shown in Table 3.2-26, the worst-case construction schedule for the proposed project would be expected to result in ROG, NO_x, PM₁₀, and PM_{2.5} emissions that would exceed the significance thresholds. Therefore, the Expedited BARCT Implementation Schedule would result in significant air quality impacts during construction activities, which would also be cumulatively considerable. The significant construction air quality impacts would be reduced under Alternative 2. As shown in Table 4.3-2, Alternative 2 would be expected to reduce the overlap in construction emissions. However, the emissions, while less than the proposed project, would still be expected to exceed the significance threshold and impacts from construction emissions would remain significant.

TABLE 4.3-2

Estimated Construction Emissions Under Alternative 2

ACTIVITY	ROG	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Peak Daily Concurrent Construction Emissions (lbs/day)						
2 VRU, Incinerators, or Vapor Combustors	0.1	0.7	0.9	<0.1	0.3	0.2
2 Domes	4.9	49.6	46.8	0.2	5.2	3.1
3 Refinery WGS	51	201	252	0.3	117	69
Total Concurrent Emissions (lbs/day)	56.0	251.3	299.7	0.6	122.5	72.3
Significance Thresholds	54	None	54	None	82	54
Significant?	Yes	--	Yes	--	Yes	Yes
Proposed Project Emission Estimates	70.5	347.7	395.2	1.5	135.6	81.3

The operational air quality impacts associated with the proposed project were determined to be less than significant. Impacts from the potential increase in operational emissions, including the emissions from truck traffic, were determined to be less than significant.

The operational emissions under Alternative 2 would remain the same as the proposed project and associated impacts would also be less than significant.

The overall emission benefits that are expected from the proposed project are presented in Table 4.3-1. For some of the potential rule development projects, emission reductions may be unknown at this time but would nonetheless be expected to occur. Under Alternative 2, the beneficial impacts associated with ROG emission reductions (75 to 125 tons per year) and SOx emissions reductions (1,265 tons per year) still be expected to occur. However, those benefits could be delayed for several years. Therefore, Alternative 2 could result in emission reductions forgone (not achieved) during the two year delay period of an estimated 150 – 250 tons of ROG and up to 2,530 tons of SOx.

Impacts from the potential increase in TAC emissions associated with the proposed project were also determined to be less than significant. The proposed project is expected to result in a beneficial reduction in TAC emissions, as well, as criteria pollutants. However, it is not possible to estimate the potential TAC emissions reductions at this point until appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control ROG emissions (e.g., domes on tanks and additional ROG monitoring on fugitive components in heavy liquid service) as a result of the proposed project is expected to result in a reduction in TAC emissions from affected facilities. The potential TAC emissions reductions under the proposed project are expected to be the same as the proposed project, although those reductions may be delayed for a period of approximately two years.

4.3.2.2 Hazards and Hazardous Materials

The hazard impacts associated with the installation of air pollution control equipment under the Expedited BARCT Implementation Schedule are expected to be less than significant. All of the air pollution control equipment that would installed under the proposed project would also be installed under Alternative 2. Therefore, hazard impacts under Alternative 2 would be the same as the proposed project and less than significant.

4.3.2.2 Hydrology and Water Quality

Water demand impacts from operating WGS systems at refinery FCCUs, additional lime injection at a cement kiln, and a LoTOx at a coke calciner may exceed applicable water demand significance thresholds and, therefore, water demand impacts associated with the proposed project were concluded to be significant after mitigation and cumulatively considerable. All of the air pollution control equipment that would be installed under the proposed project would also be installed under Alternative 2. Therefore, water demand impacts under Alternative 2 would remain significant.

Under the proposed project, 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, were concluded to be less than significant. All of the air pollution control equipment that would be installed

under the proposed project would also be installed under Alternative 2. Therefore, water quality impacts under Alternative 2 would be the same as the proposed project and less than significant.

4.4 CONCLUSION

Alternative 1 - No Project Alternative would theoretically reduce the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} construction air quality impacts and water demand impacts associated with the Expedited BARCT Implementation Schedule. However, Alternative 1 is not feasible due to legal factors, as it would violate the requirements of AB 617. Further, Alternative 1 would not achieve any of the project objectives 1 through 4 (see page 4-1).

Under Alternative 2, the BARCT Implementation Schedule would be extended with all of the proposed rule development projects implemented by 2023, instead of 2021. The impacts under Alternative 2 would essentially be the same as the proposed project, as all of the proposed rule projects included in the proposed project would also be implemented under Alternative 2. The potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} construction air quality impacts would be reduced, but they would not be reduced to less than significant.

Under Alternative 2, the beneficial impacts associated with ROG emission reductions (75 to 125 tons per year) and SO_x emissions reductions (1,265 tons per year) would still be expected to occur. However, those emission reduction benefits could be delayed for several years. Therefore, Alternative 2 could result in emission reductions forgone (not achieved) during the two year delay period of an estimated 150 – 250 tons of ROG and up to 2,530 tons of SO_x.

Finally, potentially significant water demand impacts would remain as the same as the proposed project, because all of the air pollution control equipment under the proposed project, would still be implemented under Alternative 2, including the WGS and LoTOx equipment. Water demand impacts under Alternative 2 would remain significant and cumulatively considerable.

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 4.5-1 provides this matrix comparison displaying the major characteristics and significant environmental effects of each alternative. Table 4.5-1 lists the alternatives considered in this EIR and how they compare to the 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

ENVIRONMENTAL TOPIC	Proposed Project	Alternative 1 No Project Alternative	Alternative 2 Delayed BARCT Implementation Schedule
Air Quality			
Construction Emission Impacts	PS	NS (-)	PS (-)
Operational Criteria Pollutant Impacts	NS	NS (-)	NS (=)
Toxic Air Contaminant Impacts	NS	NS (-)	NS (=)
Cumulative Air Quality Impacts	PS	NS (-)	PS (-)
Hazards and Hazardous Materials			
Operational Hazard Impacts	NS	NS (-)	NS (=)
Transportation Hazard Impacts	NS	NS (-)	NS (=)
Cumulative Hazards Impacts	NS	NS (-)	NS (=)
Hydrology and Water Quality			
Construction Water Demand Impacts	NS	NS (-)	NS (=)
Operational Water Demand Impacts	PS	NS (-)	PS (=)
Wastewater/Water Quality Impacts	NS	NS (-)	NS (=)
Cumulative Hydrology/Water Quality Impacts	PS	NS (-)	PS (=)

Notes:

- PS = Potentially significant
- MNS = Mitigated to less than significant
- NS = Less than significant
- (-) = 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.

As shown in Table 4.5-1, Alternative 1 would eliminate the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} impacts associated with construction activities but would not achieve any of the proposed project objectives. Alternative 1 could be considered the environmentally superior alternative. Alternative 2 would reduce the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} impacts associated with construction activities, but not to less than significant levels, and the water demand impact would be the same as the proposed project; however, Alternative 2 would achieve all of the project objectives. Since Alternative 2 would reduce the potentially significant ROG, NO_x, PM₁₀, and PM_{2.5} impacts and achieve the project objectives, Alternative 2 would be considered the environmentally superior alternative.

The proposed project would be considered the preferred alternative as it would achieve all of the project objectives and emission reductions associated with the implementation of BARCT on the affected facilities would be expected to occur two years earlier than under Alternative 2.

The proposed project has been demonstrated to be the most effective approach that achieves all of the project objectives relative to environmental impacts generated. Mitigation measures have been developed to minimize the potential increase in construction emissions and water demand, while providing the greatest public health benefit by reducing criteria pollutant emissions from stationary sources to the greatest feasible extent. Further, emission reductions associated with the implementation of BARCT on the affected facilities would be expected to occur two years earlier than under Alternative 2. Therefore, the proposed project is the preferred alternative.

CHAPTER 5

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Organizations and Persons Consulted
List of Environmental Impact Report Preparers

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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.

Victor Douglas
Todd Gonsalves
Guy Gimlen
David Joe

5.3 LIST OF ENVIRONMENTAL IMPACT REPORT PREPARERS

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San Francisco, California

Environmental Audit, Inc.
Placentia, California

APPENDIX A

NOTICE OF PREPARATION AND INITIAL STUDY

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California Environmental Quality Act
Notice of Preparation of Draft Environmental Impact Report
and Scoping Meeting
for AB 617 Expedited Best Available Retrofit Control Technology Implementation
Schedule

TO: Interested Parties

FROM: Bay Area Air Quality
Management District
375 Beale St., Suite 600
San Francisco, CA 94105

Lead Agency: Bay Area Air Quality Management District
Contact: Victor Douglas, Manager **Phone:** (415) 749-4752

**SUBJECT: NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT
AND SCOPING MEETING**

Notice is hereby given pursuant to California Public Resources Code §21091, 21092, 21092.2, and 21092.3 and CEQA Guidelines Section 15085 and 15087 that the Bay Area Air Quality Management District ("Air District"), as lead agency, will prepare a Draft Environmental Impact Report (EIR) in connection with the project described below.

Project Title: AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule

Project Location: The project would apply within the Bay Area Air Quality Management District ("Air District"), 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 AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule is intended to satisfy the requirements of Assembly Bill 617 (AB 617), which requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology at industrial sources subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. The overall purpose of BARCT implementation is to reduce criteria pollutant emissions from these industrial sources. The project identifies six potential rule development projects to reduce air pollution from a variety of industrial stationary sources located throughout the San Francisco Bay Area Air Basin. The potential rule development projects include rules for organic liquid storage tanks, petroleum wastewater treating, Portland cement manufacturing, refinery fluid catalytic crackers and CO boilers, refinery heavy liquid leaks, and petroleum coke calcining.

Scoping Meetings: Notice is also given pursuant to California Public Resource Code, Sections 15206 and 15082 (c) that the Air District will conduct a California Environmental Quality Act (CEQA) scoping meeting at the Air District Headquarters' Yerba Buena Room, 375 Beale Street, San Francisco, California, on August 24, 2018 at 2 p.m., to discuss and accept oral comments on the scope and content described in a Notice of Preparation and an Initial Study (NOP/IS) prepared in anticipation of a draft Environmental Impact Report (DEIR) for the project.

Reviewing the Notice of Preparation/Initial Study (NOP/IS): The NOP/IS documents are available at the District headquarters, on the Air District's website at www.baaqmd.gov/ab617barct, or by request. Requests for copies of the NOP/IS should be directed to David Joe (djoe@baaqmd.gov) at (415) 749-8623.

Comment Procedure: Comments relating to the environmental analysis in the NOP/IS should be addressed to David Joe, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to djoe@baaqmd.gov. Comments on the NOP/IS will be accepted until September 7, 2018 at 5:00 p.m.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Initial Study for AB617 Expedited BARCT Implementation Schedule

Prepared by:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94109

Contact: Guy Gimlen
(415) 749-4734

August 2018

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CHAPTER 1

PROJECT DESCRIPTION

Introduction

Agency Authority

Project Location

Project Background

Project Description

Sources That May Be Subject to the Expedited BARCT Schedule

BARCT Emission Control Technologies

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District or Air District), in accordance with Assembly Bill 617, (AB 617) is preparing the best available retrofit control technology (BARCT) implementation schedule project (project or proposed project). AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution.

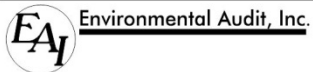
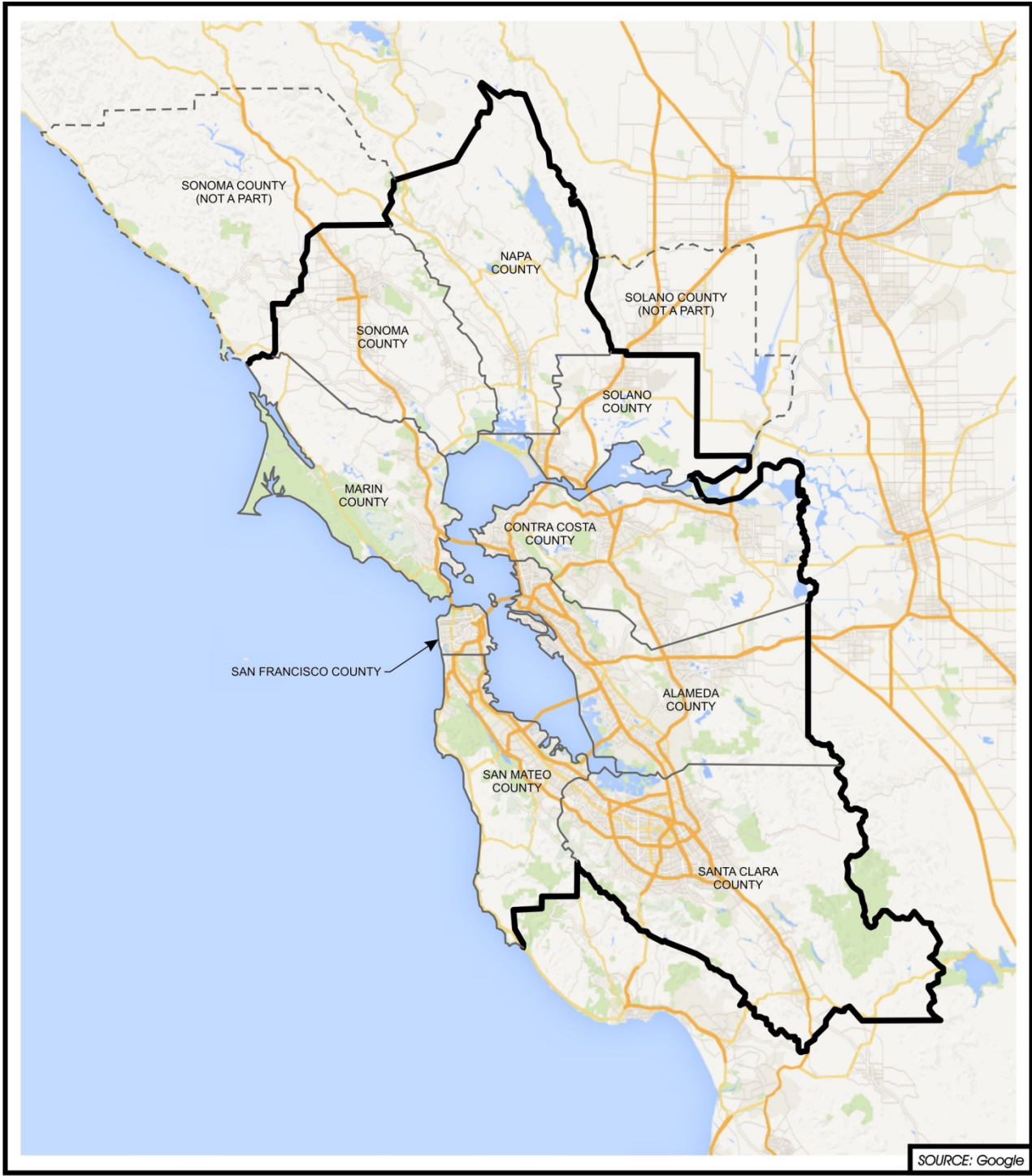
1.2 AGENCY AUTHORITY

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 this project and has prepared the Notice of Preparation/Initial Study for the proposed expedited BARCT implementation schedule.

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 Section 21067). It was determined that the Air District 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 Section 15051(b)).

1.3 PROJECT LOCATION

The Air District 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).



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

1.4 PROJECT BACKGROUND

With the adoption of AB 617, the state acknowledges that many communities around the state continue to experience disproportionate impacts from air pollution. To address these impacts, AB 617 directs all air districts to apply BARCT to all industrial sources subject to Cap-and-Trade, and to identify communities with a “high cumulative exposure burden” to air pollution. Districts must then prioritize these communities for the development of community air monitoring projects and/or emission reduction programs. The State requires that monitoring campaigns and emission reduction programs be developed through a community-based process.

AB 617 represents a significant enhancement to the approach CARB and local air districts take in addressing local air quality issues. The Air District has already implemented and established a number of programs that support the goals and intent of AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics “Hot Spots” Program, and Air District Rule 11-18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, the requirements of AB 617 formalize new programs and establish challenging goals and timelines for implementation.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. The Cap-and-Trade program includes particular provisions for “industrial” facilities, which are covered entities or facilities that are eligible for free allowance allocation. Under the Cap-and-Trade program, these free allocations are provided to certain industrial sectors to minimize potential leakage of economic activity and GHG emissions. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution. The proposed project aims to implement rule development projects that will require the use of BARCT for specific equipment in industrial facilities that are subject to GHG Cap-and-Trade requirements in order to reduce criteria pollutant emissions.

1.5 PROJECT DESCRIPTION

The expedited BARCT Implementation Schedule strategy will consist of the implementation of several rule development projects in order to fulfill the requirements of AB 617. The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), SO₂, NO₂, and Lead. The air basin is designated as nonattainment for ozone (O₃) and particulate matter (PM_{2.5} and PM₁₀) California ambient air standards, therefore the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NO_x)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM₁₀)
- Particulate Matter less than 2.5 microns (PM_{2.5})
- Sulfur Dioxide (SO₂)

NO_x and ROG are included because they are precursors for ozone formation. SO₂ may contribute to the formation of condensable PM (i.e. formed in the emissions plume from the stack) at certain types of sources, so PM control strategies may include SO₂ limits.

A list of facilities, sources, and emissions were developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. This list of facilities was reduced to 19 “industrial” facilities, which includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation (17 CCR § 95890(a)). These 19 industrial Cap-and-Trade facilities encompass 1,899 individual sources in 50 source categories. These sources were reviewed, and screening was conducted to remove sources where potential emission reductions would likely be small and not cost-effective (e.g., less than 10 pounds per day) and sources that already comply with BARCT. After screening for these sources with emissions greater than 10 pounds per day and sources that do not already achieve BARCT, the population of sources was reduced to the following (percentage values represent the percentage of total emissions from initial population of industrial Cap-and-Trade sources in the Bay Area):

- NO_x: 21 source categories, 73 sources representing 30% of the emissions (1,764 tpy)
- ROG: 23 source categories, 259 sources representing 93% of the emissions (4,430 tpy)
- PM: 16 source categories, 124 sources representing 92% of the emissions (2,358 tpy)
- SO₂: 15 source categories, 102 sources representing 71% of the emissions (3,651 tpy)

The Air District reviewed available information on current achievable emission limits and potential controls for each source category and pollutant. This information included guidelines and recent determinations of BACT, reasonably available control technology (RACT), and lowest achievable emission rate (LAER) from EPA and CARB. Six potential priority rule development projects have been identified as candidates for the expedited BARCT Implementation Schedule Project. Potential priority rule development projects are shown in Table 1-1.

1.6 SOURCES THAT MAY BE SUBJECT TO THE EXPEDITED BARCT SCHEDULE

The overall purpose of the expedited BARCT implementation schedule is to reduce criteria pollutant emissions from industrial sources that participate in CARB’s GHG Cap-And-Trade program. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities. The expedited BARCT implementation schedule would apply to a wide range of commercial, industrial, and municipal facilities including petroleum refineries, chemical plants, wastewater treatment facilities, and manufacturing operations. Table 1-2 shows the most likely types of facilities anticipated to be subject to the expedited BARCT implementation schedule and the primary emissions that would be controlled.

TABLE 1-1 – Expedited BARCT Schedule Priority Rule Development Projects

PROPOSED RULE DEVELOPMENT PROJECTS – BARCT IMPLEMENTATION PLAN		
Project Name	Pollutant	Rule Development Project Summary
Organic Liquid Storage Tanks	ROG	Regulation 8, Rule 5: Storage of Organic Liquids would be amended to specifically address ROGs and associated TACs emissions from external floating roof tanks storing organic liquids. Emission reductions are expected from installing domes on external floating roof tanks and capturing emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit to a thermal incinerator.
Petroleum Wastewater Treating	ROG	The Air District has addressed ROG emissions from petroleum wastewater treatment facilities (Rule 8-8 Wastewater Collection and Separation Systems) in previous rule developments. This project will review each of the five Bay Area refineries for any opportunities for reduction of wastewater ROG emissions. BACT for refinery wastewater systems includes the use of entirely enclosed systems in addition to good control practices.
Portland Cement Manufacturing	PM SO ₂	BARCT levels are still under development for PM emissions in cement kilns; however, controls will likely involve the reduction of SO ₂ , ammonia, or other condensable components and precursors. BARCT for SO ₂ emissions reductions includes the judicious selection and use of raw materials, dry scrubbing, and dry sorbent (lime) injection.
Refinery Fluid Catalytic Crackers and CO Boilers	PM SO ₂	PM and SO ₂ emissions reductions are expected through optimization of ammonia injection, additional ESP capacity, optimization of newer catalyst additives, and/or wet gas scrubbing.
Refinery Heavy Liquid Leaks	ROG	Amendments to Regulation 8, Rule 18: Equipment Leaks (Rule 8-18) in December 2015 addressed equipment that service heavy liquids at these sources, but those amendments have not yet been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. The District is coordinating with each of the five Bay Area refineries to conduct Heavy Liquid Leak Studies. These studies are designed to determine appropriate emission factors for heavy liquid leaks. The results of these studies are expected by Fall 2018. BARCT levels will likely be set after these studies have concluded; implementation is expected to involve additional leak detection and repair (LDAR) provisions for components in heavy liquid service.
Petroleum Coke Calcining	NOx	Regulation 9, Rule 14: Petroleum Coke Calcining Operations (Rule 9-14), which currently only addresses SO ₂ emissions, may be amended to include NOx emission limits. Technologies available for NOx reduction in petroleum coke calcining operations is expected to include SCRs and LoTOx injection systems.

TABLE 1-2

Summary of Facilities and Sources Where BARCT Priority Rule Projects May Apply Under the Expedited BARCT Schedule Requirements

Facility	Sources	Pollutants Controlled
Refineries	Fugitive Emissions (tanks, valves, pumps, compressors) Fluidized Catalytic Cracking Units CO Boilers Wastewater Treatment Operations	ROG PM SO ₂
Petroleum Coke Calcining	Coke Calciners	NO _x
Cement Manufacturing	Cement Kiln	PM SO ₂
Refineries, Chemical Plants, Bulk Storage and Transfer Operations, and General Manufacturing	Organic Liquid Storage Tanks	ROG

1.6.1 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). Crude oil that originates from different geographical locations may vary with respect to its composition, thus, potentially generating different types and amounts of emissions. The types of equipment where BARCT may be applied under the expedited BARCT requirements are further described below.

Fugitive Emissions Sources: Petroleum refineries include 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 and do not include pollutants vented to an exhaust stack before release to the atmosphere. Generally, any processes or transfer areas where leaks can occur are sources of fugitive emissions. Fugitive emissions sources include, but are not limited to the following: valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, pressure relief devices, and diaphragms in ROG service. Fugitive emissions are generally controlled through leak detection and repair (LDAR) programs. Similarly, tanks storing crude oil or petroleum products also produce fugitive emissions.

Fluid Catalytic Cracking Units (FCCUs) and CO Boilers: FCCUs are complex processing units that convert heavy components of crude oil into light, high-octane products that are required in the production of gasoline. Each FCCU consists of a reaction chamber, a catalyst regenerator, and a fractionator. The cracking process begins in the reaction chamber where fresh catalyst is mixed with pre-heated heavy oils. A chemical reaction occurs that converts the heavy oil into a cracked hydrocarbon vapor mixed with catalyst. As the cracking reaction progresses, the cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into lighter hydrocarbon components such as light gases, gasoline, light gas oil, and cycle oil. The catalyst becomes coated with carbonaceous material (coke)

during its exposure to the hydrocarbon feedstock. FCCUs include a catalyst regenerator where coke is burned off the surface of the catalyst to restore its activity so it can be re-used. Catalyst regenerators may be designed to burn the coke completely to carbon dioxide (full burn) or to only partially burn the coke to a mixture of CO and CO₂ (partial burn). Because the flue gas from these partial burn regenerators has high levels of CO, the flue gas is vented to a CO boiler where the CO is further combusted to CO₂. FCCUs and associated CO boilers can generate substantial PM, NO_x, and SO₂ emissions.

Petroleum Wastewater Treating: All refineries employ some form of wastewater treatment so that water effluents can safely be reused at the refinery or discharged. Wastewater treatment operations provide a means of treating water that has come into contact with petroleum hydrocarbons, and, as such, are a potential source of ROG emissions. The design of wastewater treatment plants is complicated by the diversity of refinery pollutants, including oil, phenols, sulfides, dissolved solids, and toxic chemicals. Although the treatment processes employed by refineries vary greatly they generally include drain systems, neutralizers, oil/water separators, settling chambers, clarifiers, dissolved air flotation systems, coagulators, and activated sludge units.

Drain systems consist of individual process drains, where oily water from various sources is collected, and junction boxes, which receive the oily water from multiple drains. The first stage of a typical wastewater treatment process is the oil-water separator, which physically separates the free oil and solids from the water. Gravity allows any oil in the water to rise to the surface of the separator and any solid particles to sink to the bottom. A continually moving scraper system pushes oil to one end and the solids to the other. Both are removed and the recovered oil is sent back to the refinery for reprocessing. Small suspended oil particles are then typically removed in the dissolved air flotation unit. Wastewater is sent to the activated sludge units, where naturally-occurring microorganisms feed on the dissolved organics in the wastewater, and convert them to water, CO₂ and nitrogen gas, which can be safely released into the atmosphere. Finally, wastewater enters the clarifying tanks, where the microorganisms settle to the bottom while the treated wastewater flows away.

1.6.2 PETROLEUM COKE CALCINING

Petroleum coke, the heaviest portion of crude oil, cannot be recovered in the normal refining process. Instead, petroleum coke is processed in a delayed coker unit 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 can be used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined (removing impurities) 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 to the bottom of the kiln, it rests in the kiln for approximately one additional hour to eliminate any remaining moisture, impurities, and hydrocarbons. Hot gases from the calciner are sent to a pyroscrubber that

removes particulates through a combination of settling and incineration and sulfur compounds are oxidized to SO₂. 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 and sold for industrial uses.

1.6.3 CEMENT MANUFACTURING

Cement is manufactured in a cement kiln using a pyroprocess or high temperature reactor that is constructed along a longitudinal axis with segmented rotating cylinders whose connected length is anywhere from 50 to 200 yards in length. The pyroprocess in the kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in the kiln, the drying and pre-heating zone, operates at a temperature between 1,000 °F and 1,600 °F and evaporates any remaining water in the raw mix of materials entering the kiln. The second phase, the calcining zone, operates at a temperature between 1,600 °F and 1,800 °F and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases CO₂. During the third phase, the burning zone operates on average at 2,200 °F to 2,700 °F (though the flame temperature can at times exceed 3,400 °F) during which several reactions and side reactions occur. As the materials move towards the discharge end, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. The red-hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage.

As indicated above, cement manufacturing occurs at high temperatures and uses several combustion fuels. Fuels that have been used for primary firing include coal, petroleum coke, heavy fuel oil, natural gas, landfill off-gas and oil refinery flare gas. High carbon fuels such as coal are preferred for kiln firing, because they yield a luminous flame. The clinker is brought to its peak temperature mainly by radiant heat transfer, and a bright (i.e. high emissivity) and hot flame is essential for this. Combustion emissions are exhausted through the kiln's stack.

At cement manufacturing facilities, fugitive dust may consist of wind-driven particulate matter emissions from any disturbed surface work area that are generated by wind action alone. The process of making cement begins with the acquisition of raw materials, predominantly limestone rock (calcium carbonate) and clay, which exist naturally in rocks and sediment on the earth's surface. These and other materials used to manufacture cement are typically mined at nearby quarries and comprise "raw mix." The raw mix is refined by a series of mechanical crushing and grinding operations to segregate and eventually reduce the size of each component to 0.75 inch or smaller before being conveyed to storage.

1.6.4 ORGANIC LIQUID STORAGE FACILITIES

Storage vessels containing organic liquids can be found in many industries, including: (1) petroleum producing and refining; (2) petrochemical and chemical manufacturing; (3) bulk storage and transfer operations; and (4) other industries consuming or producing organic liquids. Organic liquids in the petroleum industry generally are mixtures of hydrocarbons having dissimilar true vapor pressures (for example, gasoline and crude oil). Organic liquids in the chemical industry are composed of pure chemicals or mixtures of chemical with similar vapor pressures (for example, benzene or a mixture of isopropyl and butyl alcohols). Tanks associated with refineries comprise over 95 percent of the organic liquid storage tanks identified in the BARCT evaluation process.

Six basic tank designs are used for organic liquid storage vessels: fixed roof (vertical and horizontal), external floating roof, domed external (or covered) floating roof, internal floating roof, variable vapor space, and pressure tanks (low and high). ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of evaporative loss. Emissions from fixed roof tanks are a result of evaporative losses during storage (breathing losses or standing storage losses) and evaporative losses during filling and emptying operations (referred to as working losses). External and internal floating roof tanks are ROG emission sources because of evaporative losses that occur during standing storage and withdrawal of liquid from the tank. Standing storage losses are a result of evaporative losses through rim seams, deck fittings, and/or deck seams. Pressure tank losses occur when connecting to or disconnecting from the tank.

1.7 BARCT EMISSION CONTROL TECHNOLOGIES

The expedited implementation of BARCT would apply to existing facilities in the Bay Area that are generally large sources of emissions and included in the CARB GHG Cap-and-Trade program as industrial facilities. The overall purpose of the BARCT implementation schedule project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade program. Emissions of criteria pollutants and TACs are often associated with GHG emission sources.

To comply with the BARCT requirements, operators at affected facilities may need to implement different types of air pollution control equipment or measures. The type of emission capture and control technology that may be used depends on the specific source and type of pollutant to be controlled. The most common air pollution control measures that are likely to be implemented as a result of the proposed expedited BARCT schedule are categorized into the following groups and are summarized in Table 1-3:

- Installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit;
- Covering lift stations, manholes, junction boxes, conveyances and other wastewater facilities at refineries and venting ROG emissions to a vapor combustor;
- Requiring additional lime injection on cement kilns to reduce SO₂ emissions;
- Controlling PM emissions from FCCUs using SO₂ reducing catalyst additives, additional ESP capacity, or wet gas scrubbers;
- Reducing ROG emissions from fugitive components in heavy liquid service at refineries through increased LDAR programs;
- Reducing NO_x emissions from coke calcining facilities through the use of SCR units and/or LoTOx system with a wet gas scrubber.

TABLE 1-3

Control Strategies and Target Pollutants

Control Strategy	Pollutant
Additional Controls on Organic Liquid Storage Tanks	ROG
Enclosures and Vapor Combustors at Refinery Wastewater Treatment Plants	ROG
Additional Lime Injection at Cement Plants	PM and SO ₂
Wet Gas Scrubbers, Additional ESP Capacity, and SO ₂ Reducing Catalysts at Refinery FCCUs and CO Boilers	PM and SO ₂
Increase LDAR for Equipment in Heavy Liquid Service Refineries	ROG
SCR and LoTOx (wet scrubber) at Petroleum Coke Calciners	NO _x

The following subsections briefly describe the most likely types of control technologies that would be used to comply with the BARCT rules included in the expedited BARCT implementation schedule.

1.7.1 ADDITIONAL CONTROLS ON ORGANIC LIQUID STORAGE TANKS

ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of evaporative loss.

Potential ROG emission reductions would be achieved by installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit (VRU) flowing back to the tank for recovery or VRU to a thermal incinerator. Thermal oxidizers, or thermal incinerators, are combustion devices that control volatile TAC emissions by combusting them to CO₂ and water. Domed roofs on external floating roofs without VRUs would reduce ROG emissions by limiting wind effects.

1.7.2 ENCLOSURES AND VAPOR COMBUSTORS AT REFINERY WASTEWATER TREATMENT PLANTS

The main component of atmospheric emissions from refinery wastewater treatment plants are fugitive ROG emissions and dissolved gases that evaporate from the surfaces of wastewater residing in open process drains, separators, and ponds. The control of wastewater treatment plant emissions involves covering systems where emission generation is greatest (such as oil/water separators and settling basins) and removing dissolved gases from water streams with sour water strippers before contact with the atmosphere. Covering wastewater operations potentially can achieve greater than 90 percent reduction of wastewater system emissions. In addition, all lift stations, manholes, junction boxes, conveyances and any other wastewater facilities should be covered and all emissions routed to a vapor combustor with a destruction removal efficiency (DRE) of 99 percent for control. Vapor combustors are combustion devices that control ROG emissions by combusting them to carbon dioxide and water.

1.7.3 LIME INJECTION AT CEMENT PLANTS

The formation of SO₂ in cement kilns is a product of the chemical composition of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. In a lime injection system, a hydrated lime powder is injected into the flue gas to capture acidic gases. The cement kiln within the District's jurisdiction currently operates a lime injection system for the control of hydrogen chloride (HCl) emissions, but the use of additional lime or additional lime injection capacity would likely be needed to further control SO₂ emissions. SO₂ reacts with lime (calcium carbonate) and is captured in the baghouse as calcium sulfate. The hydrated lime usually absorbs up to 60% of the SO₂ in the gases if injected at the correct temperature.

1.7.4 WET GAS SCRUBBERS

In wet scrubbing processes, liquid or solid particles are removed from a gas stream by transferring them to a liquid. This addresses only wet scrubbers for control of particulate matter. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy

expended in contacting the gas stream with the scrubber liquid. Most wet scrubbing systems operate with particulate collection efficiencies over 95 percent (U.S. EPA, 2017).

There are three energy usage levels for wet scrubbers. A low energy wet scrubber is capable of efficiently removing particles greater than about 5-10 micrometers in diameter. A medium energy scrubber is capable of removing micrometer-sized particles, but is not very efficient on sub-micrometer particles. A high-energy scrubber is able to remove sub-micrometer particles.

A spray tower scrubber is a low energy scrubber and is the simplest wet scrubber used for particulate control. It consists of an open vessel with one or more sets of spray nozzles to distribute the scrubbing liquid. Typically, the gas stream enters at the bottom and passes upward through the sprays. The particles are collected when they impact the droplets. This is referred to as counter-current operation. Spray towers can also be operated in a cross-current arrangement. In cross-current scrubbers, the gas flow is horizontal and the liquid sprays flow downward. Cross-current spray towers are not usually as efficient as counter-current units.

The most common high energy wet scrubber is the venturi, although it can also be operated as a medium energy scrubber. In a fixed-throat venturi, the gas stream enters a converging section where it is accelerated toward the throat section. In the throat section, the high-velocity gas stream strikes liquid streams that are injected at right angles to the gas flow, shattering the liquid into small drops. The particles are collected when they impact the slower moving drops. Following the throat section, the gas stream passes through a diverging section that reduces the velocity.

All wet scrubber designs incorporate mist eliminators or entrainment separators to remove entrained droplets. The process of contacting the gas and liquid streams results in entrained droplets, which contain the contaminants or particulate matter. The most common mist eliminators are chevrons, mesh pads, and cyclones. Chevrons are simply zig-zag baffles that cause the gas stream to turn several times as it passes through the mist eliminator. The liquid droplets are collected on the blades of the chevron and drain back into the scrubber. Mesh pads are made from interlaced fibers that serve as the collection area. A cyclone is typically used for the small droplets generated in a venturi scrubber. The gas stream exiting the venturi enters the bottom of a vertical cylinder tangentially. The droplets are removed by centrifugal force as the gas stream spirals upward to the outlet.

1.7.5 ELECTROSTATIC PRECIPITATOR

An ESP is a control device designed to remove particulate matter (both PM₁₀ and PM_{2.5}) 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. When enough particulates have accumulated, the collectors are shaken

to dislodge the dust, causing it to fall by gravity to hoppers below and then removed by a conveyor system for disposal or recycling. ESPs can handle large volumes of exhaust gases and because no filters are used, ESPs can handle hot gases from 350 °F to 1,300 °F.

1.7.6 SO₂ REDUCING CATALYSTS

To help reduce formation of condensable particulate matter from sulfurous components, SO_x-reducing additives (catalysts) are used for reducing the production of SO_x by-products in FCCUs. A SO_x reducing catalyst is a metal oxide compound such as aluminum oxide (Al₂O₃), magnesium oxide (MgO), vanadium pentoxide (V₂O₅) 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 SO₂, CO, and CO₂ by-products are formed. A portion of SO₂ will react with excess oxygen and form SO₃, which will either stay in the flue gas or react with the metal oxide in the SO_x-reducing catalyst to form 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 (H₂S). The net effect of these reactions is that the quantity of SO₂ in the regenerator is typically reduced between 40 to 65 percent while the quantity of H₂S in the reactor is increased. Generally, the increase in H₂S is handled by sulfur recovery processes located elsewhere within a refinery.

1.7.7 ENHANCED LDAR FOR COMPONENTS IN HEAVY LIQUID SERVICE

Oil refineries, chemical plants, bulk plants, bulk terminals, and other facilities that store, transport and use organic liquids may occasionally have leaks wherever there is a connection between two pieces of equipment, and lose some organic material as fugitive ROG emissions. Valves, pumps, and compressors can also leak organic materials. The District Rule 8-18 requires such facilities to maintain LDAR programs. The rule originally required the monitoring of components in light hydrocarbon liquid service, but was expanded in 2015 to include equipment in heavy hydrocarbon liquid service. Those amendments have not been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. The District is in the process of conducting studies to determine appropriate emission factors for heavy liquid leaks. Completion of the heavy liquid leak study has been problematic, because some heavy hydrocarbon liquids are condensing and coating the leak detection sensors. The study approach is being re-configured and the results are expected by Fall 2018. The results of the study will be used to determine appropriate revisions to Rule 8-18, e.g., types of monitoring instruments, frequency of monitoring, leak concentration limits, time allowed for repair of the leak, recordkeeping requirements, etc.

1.7.8 SELECTIVE CATALYTIC REDUCTION (SCR) AT PETROLEUM COKE CALCINERS

SCR is post combustion control equipment for NO_x control of combustion sources such as boilers and process heaters and is capable of reducing NO_x emissions by as much as 95 percent or higher. A typical SCR system consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, and exhaust stack plus ancillary electronic instrumentation and operations control equipment. An SCR system reduces NO_x by injecting a mixture of ammonia and air into the flue gas exhaust stream from the combustion equipment. This mixture flows into the SCR reactor where the catalyst, ammonia and oxygen in the flue gas exhaust reacts with NO and NO₂ to form nitrogen and water in the presence of the catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NO_x for optimum control efficiency, though the ratio may vary based on equipment-specific NO_x reduction requirements. SCR catalysts are available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide that is coated with either tungsten trioxide, molybdenic anhydride, vanadium pentoxide, iron oxide, or zeolite catalysts. These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of five years or more. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, etc. (SCAQMD, 2015).

For conventional SCRs, the minimum temperature for NO_x reduction is 500°F and the maximum operating temperature for the catalyst is 800 °F. The presence of particulates, heavy metals, sulfur compounds, and silica in the flue gas exhaust can limit catalyst performance. Minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range helps to avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as “ammonia slip.” Depending on the type of combustion equipment utilizing SCR, the typical amount of ammonia slip can vary between less than five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life.

1.7.9 LOTOX (WET SCRUBBER) AT PETROLEUM COKE CALCINERS

The LoTOx™ is a registered trademark of Linde LLC (previously BOC Gases) and was later licensed to BELCO of Dupont for refinery applications. LoTOx™ stands for “Low Temperature Oxidation” process in which ozone (O₃) is used to oxidize insoluble NO_x compounds into soluble NO_x compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOx™ process is a low temperature application, optimally operating at about 325 °F.

A typical combustion process produces about 95 percent NO and five percent NO₂. Because both NO and NO₂ are relatively insoluble in an aqueous solution, a WGS alone is not efficient in removing these insoluble compounds from the flue gas stream. However, with a LoTOx™ system and the introduction of O₃, NO and NO₂ can be easily oxidized into a highly soluble compound N₂O₅ and subsequently converted to nitric acid (HNO₃). Then, in a wet gas scrubber for example, the HNO₃ is rapidly absorbed in caustic (NaOH), limestone or lime solution. The LoTOx™ process can be integrated with any type of wet scrubbers (e.g., venturi, packed beds), semi-dry scrubbers, or wet ESPs. In addition, because the rates of oxidizing reactions for NO_x are fast compared to the very slow SO₂ oxidation reaction, no ammonium bisulfate ((NH₄)HSO₄) or sulfur trioxide (SO₃) is formed (Confuorto and Sexton, 2007).

CHAPTER 2

ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Evaluation of Environmental Impacts

Environmental Checklist and Discussion

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:	AB 617 Expedited BARCT Implementation Schedule
Lead Agency Name and Address:	Bay Area Air Quality Management District 375 Beale Street, Suite 600 San Francisco, California 94105
Contact Person:	Guy Gimlen
Contact Phone Number:	415-749-4734
Project Location:	BARCT would apply to industrial sources subject to California GHG Cap-and-Trade requirements 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.
Project Sponsor's Name and Address:	Bay Area Air Quality Management District 375 Beale Street, Suite 600 San Francisco, California 94105
General Plan Designation:	The general plan designation varies as this rule would affect industrial facilities throughout the Bay Area. The majority of affected facilities are located within industrial or commercial designations.
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. Impact areas in which the proposed project may have a significant impact are marked with a “✓”. An explanation supporting the determination of significant impacts can be found in the Detailed Checklist and Discussion section below.

- | | | |
|--|---|---|
| <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 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"/> Tribal Cultural Resources | <input checked="" 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:

Date:

Printed Name:

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

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The Bay Area Air Quality Management District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano County and southern Sonoma County. 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. Important views of natural features include the San Francisco Bay and ocean, San Francisco Bay, Mount Tamalpais, Mount Diablo, and other peaks and inland valleys of the Coast Range. Cityscape views offered by buildings and distinctive Bay Area bridges, especially the Golden Gate and Bay Bridges and the San Francisco skyline, are also important built visual resources to the region (ABAG, 2017). Views along travel corridors, including roads and rail lines, are in abundance in the Bay Area and include views of the San Francisco Bay, city scape, mountains and hills, redwood groves, and broader views of the ocean and lowlands, such as along ridgelines. Because of the variety of visual resources, scenic highways or corridors are located throughout the Bay Area and includes 15 routes that have been designated as scenic highways and 29 routes eligible for designation as scenic highways (ABAG, 2017).

BARCT would apply to a limited number of industrial sources with physical modifications limited to facilities in industrial or commercial areas. Scenic highways or corridors are generally not located in the vicinity of industrial facilities.

Regulatory Background

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

Significance Criteria

Project-related impacts on aesthetics and visual resources will be considered significant if any of the following conditions are met:

- The proposed project would have a substantial adverse effect on a scenic vista.
- The proposed project would substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway.
- The proposed project would substantially degrade the existing visual character or quality of the site and its surrounds.
- The proposed project would add a visual element of urban character to an existing rural or open space area or add a modern element to a historic area.
- The proposed project would create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

Discussion of Impacts

I. a, b, and c). The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. Some BARCT measures are not expected to be visible outside of the existing facility. This would include covering portions of petroleum wastewater treatment facilities, lime injection at cement plants, use of SO₂ reducing catalysts, and increased LDAR.

Other BARCT measures would include the installation of equipment that may be visible outside of the existing industrial facilities, however, these facilities are located in industrial areas which do not have scenic views or scenic resources. For example, domes on storage tanks increase the height of the storage tanks making them more visible to the areas surrounding the storage tanks. However, storage tanks are generally located at refineries, bulk handling and storage facilities, or manufacturing facilities and are located within industrial areas. Thus, they are not expected to have significant adverse aesthetic impacts to the surrounding community. Additionally, new air pollution control equipment is not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts.

I. d). The industrial facilities affected by the expedited BARCT requirements may need to install or modify air pollution control equipment to reduce criteria pollutant emissions from their facilities. These facilities are existing industrial facilities that currently operate or can operate 24 hours a day and have existing lighting for nighttime operations. For example, refineries operate continuously 24 hours per day, 7 days per week and are already lighted for nighttime operations. The same is true for most other types of manufacturing operations (e.g., cement plants). Therefore, implementation of the BARCT requirements is not expected to require any additional lighting to be installed as a result of the installation of new air pollution control equipment. New light sources, if any, would be located in industrial areas and 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 expedited BARCT requirements are not expected to have significant adverse aesthetic impacts to the surrounding community.

Conclusions

Based upon the above considerations, significant adverse impacts to aesthetics or light and glare are not expected to occur due to implementation of the AB 617 expedited BARCT requirements 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
II. AGRICULTURE and FORESTRY RESOURCES. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<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))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 Air District 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. Agricultural land under Williamson Act contract includes both prime and nonprime lands. Prime agricultural land includes land with certain specific soil characteristics, land that has returned a predetermined annual gross value for three of the past five years, livestock-supporting land with specific carrying capacities, or land planted with fruit or nut trees, vines, bushes or crops that have a non-bearing period of less than five years (Government Code §51200-51207). Nonprime lands include pasture and grazing lands and other non-irrigated agricultural lands with lesser soil quality.

The Bay Area has a significant amount of land in agricultural uses. In 2010, approximately over half of the region's approximately 4.5 million acres were classified as agricultural lands, as defined by the California Department of Conservation Farmland Mapping and Monitoring Program. Of these, 2.3 million acres of agricultural land, over 70 percent (about 1.7 million acres) are used for grazing. Products grown in the Bay Area include field crops, fruit and nut crops, seed crops, vegetable crops, and nursery products. Field crops, which include corn, wheat, and oats, as well as pasture lands, represent approximately 62 percent of the Bay Area agricultural land (ABAG, 2017). In 2014, about 1.25 million acres of land were under Williamson Act contract in the Bay Area. Of this, about 203,200 acres were prime farmland and one million acres were nonprime. Lands under Williamson Act contract are primarily used for pasture and grazing and not for cultivation of crops. Approximately 70 percent of prime farmlands under contract are in Santa Clara, Solano, and Sonoma counties (ABAG, 2017).

Expedited BARCT requirements would affect a limited number of facilities with physical modifications limited to facilities in industrial areas that are zoned for industrial use and agricultural or forest lands are not located within these areas or facilities.

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.

Significance Criteria

Project-related impacts on agriculture and forest resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Discussion of Impacts

II a-e. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources,

wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. This equipment would be compatible with the existing industrial character and land use of the area and would not be located in agricultural or forestland areas. Thus, no impacts to agriculture and forestry resources are expected.

The proposed project would not conflict with existing agriculture related zoning designations or Williamson Act contracts. Existing agricultural and forest resources within the boundaries of the Air District are not expected to be affected by the construction of additional air pollution control equipment or modification to existing emission sources. Therefore, there is no potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract, or impacts to forestland resources.

Conclusion

Based upon the above considerations, significant adverse impacts to agricultural or forestry resources are not expected to occur due to implementation of the AB 617 expedited BARCT requirements 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
III. AIR QUALITY. 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 checked="" type="checkbox"/>	<input type="checkbox"/>

Setting

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), and lead.

The San Francisco Bay Area is characterized by a large, shallow basin surrounded by mountain ranges tapering into sheltered inland valleys. The basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of mountains, valleys and bays. 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.

Air quality conditions in the San Francisco Bay Area have improved greatly since the Air District was created in 1955, and regional concentrations of criteria pollutants are now in compliance with or near compliance with most ambient air quality standards. The Bay Area is in attainment with both the National Ambient Air Quality Standards and the California Ambient Air Quality Standards for CO, SO₂, NO₂, and lead. The air basin is designated as nonattainment for ozone and particulate matter (PM₁₀ and PM_{2.5}) under the California ambient air quality 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, 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 Bay Area Air Quality Management District, 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 Air District is governed by a 24-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 Air District is responsible for implementing emissions standards and other requirements of federal and state laws. It is also responsible for developing air quality planning documents required by both federal and state laws.

Toxic Air Contaminants

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

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards 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 regulatory programs for the control of TACs, including: (1) California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), 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; and (2) The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California

Health and Safety Code §39656) established 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.

In 2004, the Air District initiated the Community Air Risk Evaluation (CARE) program to identify areas with relatively high concentrations of air pollution—including toxic air contaminants (TACs) and fine particulate matter—and populations most vulnerable to air pollution’s health impacts. Maps of communities most impacted by air pollution, generated through the CARE program, have been integrated into many District programs. For example, the Air District uses 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.

Significance Criteria

On June 2, 2010, the District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These CEQA thresholds were designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA. The CEQA thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the Thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards.

In view of the Supreme Court’s opinion, local agencies may rely on the District’s CEQA thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the CEQA thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project’s impacts.

The Air District published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court’s opinion. The CEQA Guidelines for implementation of the Thresholds are for information purposes only to assist local agencies. Recommendations in the Guidelines are advisory and should be followed by local governments at their own discretion. The Air District is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance. Since these are the most current air quality significance thresholds and address court decisions, they will be used in the CEQA analysis for the current project.

Construction Emissions

Regarding construction emissions, the Air District’s 2017 Thresholds of Significance will be used in the current air quality analysis for construction emissions (see Table 2-1).

TABLE 2-1

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NO _x	54
PM ₁₀	82*
PM _{2.5}	54*
PM ₁₀ / PM _{2.5} Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.

Source: BAAQMD, 2017

Operational Emissions

The most recently available CEQA Guidelines established emission thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of “no net increase in emissions” is appropriate for Air Quality Plans because they include a mix of control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The 2017 project-level stationary source CEQA thresholds are identified in Table 2-2. These represent the levels at which an individual project’s emissions would result in a cumulatively considerable contribution to the Air District’s existing air quality conditions. The Air District does not currently have significance thresholds specifically for rules. In order to provide a conservative air quality analysis, the project-specific thresholds recommended in the revised 2017 CEQA Guidelines (BAAQMD, 2017) will be used in the current air quality impacts analysis (see Table 2-2).

TABLE 2-2

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NO _x	54	10
PM ₁₀	82	15
PM _{2.5}	54	10

*Source: BAAQMD, 2017

Discussion of Impacts

III a. The proposed expedited BARCT requirements are not expected to conflict with or obstruct implementation of the applicable air quality plan. The applicable air quality plan is the Air District’s recently-adopted 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. The Plan outlines a strategy for achieving the Bay Area’s clean air goals by reducing emissions of ozone precursors, particulate matter, and other pollutants in the region. The proposed expedited BARCT schedule will not conflict with or obstruct implementation of the 2017 Clean Air Plan, rather it will help achieve the Plan’s goals by helping to reduce criteria pollutant emissions, including emissions of ozone precursors (ROG and NO_x) and particulate matter or precursors to particulates (NO_x and SO₂), thus improving public health and air quality in the region.

III b, c and d. While the primary purpose of implementing expedited BARCT requirements is to reduce emissions of ROG, NO_x, SO₂, and PM, some types of control equipment have the potential to create secondary adverse air quality impacts, through construction activities or through the addition of air pollution control equipment (e.g., SCRs). The proposed expedited BARCT schedule may result in the installation of new equipment at facilities that need to comply with the new requirements.

Limited construction activities may be required for some BARCT measures to enclose open fugitive components, install new catalyst, increase lime injection and so forth. Construction emissions associated with this type of construction would be minor and would involve the transport of the new equipment which is expected to require one to two truck trips per project. Installation of the equipment would be expected to be limited to two to ten workers and would not require any major construction equipment and no site preparation activities would be expected to be required. Therefore, retrofitting this type of existing equipment would result in minor construction emissions.

Construction activities would also be required for the construction of new air pollution control equipment at existing facilities, including vapor combustors, wet gas scrubbers, ESPs, vapor recovery systems, and SCRs. Some of the BARCT equipment would be required at existing facilities with large emission sources, e.g., refinery FCCUs. Construction activities for these types of new air pollution control equipment could be substantial because the control equipment would be needed on large sources and would need to be appropriately sized. Construction activities associated with air pollution control

equipment at large sources could be substantial and generate significant, although temporary construction emissions.

Although the primary effect of installing air pollution control equipment is to reduce emissions of a particular pollutant, e.g., NO_x, some types of control equipment have the potential to create secondary adverse air quality impacts. For example, control strategies aimed at reducing NO_x 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 formation in the atmosphere. Because of the potential for secondary emissions from air pollution control equipment, there is also a potential that sensitive receptors could be exposed to increased pollutant concentrations, which may be significant. As a result, these potential air quality impacts of the expedited BARCT measures will be evaluated in the Draft EIR.

III e. The implementation of expedited BARCT is expected to result in emission decreases associated with control of criteria pollutant emissions, including SO_x emissions. Some sulfur compounds have odors. However, a number of methods to reduce SO_x emissions involve removing additional sulfur compounds, reducing the potential for odors in downstream equipment.

Odors associated with ammonia use in new SCR systems are expected to be minimal. Ammonia can have a strong odor; however, new SCRs are not expected to generate substantial ammonia emissions. Ammonia is generally stored in an enclosed pressurized tank, which prevents fugitive ammonia emissions. Ammonia emissions from the stack (also referred to as ammonia slip) are expected to be limited to 10 ppm and implemented through permit conditions. Since exhaust emissions are buoyant as a result of being heated, ammonia in the exhaust will disperse and ultimate ground level concentrations would be expected to be substantially lower than five ppm. Five ppm is below the odor threshold for ammonia of 20 ppm (OSHA, 2005). Potential odor impacts associated with the expedited BARCT requirements are not expected to be significant. The Air District will continue to enforce odor nuisance complaints through BAAQMD Regulation 7, Odorous Substances.

Conclusion

Implementation of expedited BARCT requirements would reduce ROG, SO₂, PM and NO_x emissions from industrial facilities that operate stationary large emission sources throughout the Bay Area. However, construction and operation of new air pollution control systems have the potential to increase emissions of other criteria pollutants and generate localized impacts. Therefore, potential adverse secondary air quality impacts which could result from implementing expedited BARCT requirements 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
IV. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and 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 §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 Air District 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 Bay Area supports numerous distinct natural communities composed of a diversity of vegetative types that provide habitat for a wide variety of plant and wildlife species. Broad habitat categories in the region include grasslands, coastal scrubs and chaparral, woodlands and forests, riparian systems and freshwater aquatic habitat, and wetlands. Extensive aquatic resources are provided by the San Francisco Bay Delta estuary, as well as numerous other rivers and streams. Urban and otherwise highly disturbed habitats, such as agricultural fields, also provide natural functions and values as wildlife habitat (ABAG, 2017).

Expedited BARCT requirements would affect a limited number of facilities with physical modifications limited to facilities in industrial areas that are zoned for industrial use. Biological resources are not usually located in industrial areas.

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. EPA regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

Significance Criteria

The proposed project impacts on biological resources will be considered significant if:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion of Impacts

IV a, b, c and d). The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and

petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. These facilities have been built and graded and no major grading would be expected to occur due to the installation of additional air pollution control equipment. Construction activities would occur within industrial areas, where native biological resources have been removed or are non-existent. Thus, the proposed project is not expected to result in any impacts to biological resources.

IV e and f). The proposed project is 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 BARCT requirements are not expected to affect any habitat conservation or natural community conservation plans, biological resources or operations, and would not create divisions in any existing communities, as construction activities would be limited to existing facilities in industrial areas that have already been developed and graded.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to biological resources are not expected to occur due to implementation of the expedited BARCT requirements 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
V. CULTURAL RESOURCES. 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 Air District 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. Cultural resources also include paleontological sites, which can consist of mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains that are more than 5,000 years old and occur mainly in Pleistocene or older sedimentary rock units.

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.

Important vertebrate and invertebrate fossils and unique geologic units have been documented throughout California. The fossil yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks. Pleistocene or older (older than 11,000 years) continental sedimentary deposits are considered to have a high paleontological potential while Holocene-age deposits (less than 10,000 years old) are generally considered to have a low paleontological potential because they are

geologically immature and are unlikely to contain fossilized remains of organisms. Metamorphic and igneous rocks have a low paleontological potential, either because they formed beneath the surface of the earth (such as granite), or because they have been altered under heat and high pressures.

Historic resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529-1822) through the late 1960s are generally considered for protection if they are determined to be historically or architecturally significant. These may include missions, historic ranch lands, and structures from the Gold Rush and the region's early industrial era. More recent architectural sites may also be considered for protection if they could gain historic significance in the future (ABAG, 2017).

Of the 8,199 sites recorded in the Bay Area, there are 1,006 cultural resources listed on the California Register of Historic Resources (CRHR), meaning that they are significant at the local, State or federal level; of those, 744 are also listed on the National Register of Historic Places (NRHP). From this list, 249 resources are listed as California Historic Landmarks. The greatest concentration of historic resources listed on both the NRHP and the CRHR in the Bay Area occurs in San Francisco, with 181 resources. Alameda County has the second highest number with 147 resources (ABAG, 2017).

Expedited BARCT requirements would affect a limited number of facilities, with physical modifications limited to facilities in industrial areas that are zoned for industrial use which have been graded and developed.

Regulatory Background

The State CEQA Guidelines define a significant cultural resource as a "resource listed or eligible for listing on the California Register of Historical Resources" (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5(b)). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the California Register of Historical Resources or a local register or survey that meets the requirements of Public Resources Code §§50020.1(k) and 5024.1(g).

Significance Criteria

The proposed project impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion of Impacts

V a, b, c and d). CEQA Guidelines state that generally, a resource shall be considered ‘historically significant’ if the resource meets the criteria for listing in the California Register of Historical Resources including the following:

- A. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- B. Is associated with the lives of persons important in our past;
- C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;
- D. Has yielded or may be likely to yield information important in prehistory or history (CEQA Guidelines §15064.5).

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The expedited BARCT requirements would result in control measures and new air pollution control equipment to be constructed within the confines of the existing industrial facilities and adjacent to existing industrial structures. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3). Further, construction activities associated with the proposed project are expected to be limited to industrial areas that have already been developed. Thus, the proposed BARCT requirements would not adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries. Therefore, no impacts to cultural resources are anticipated to occur as a result of the proposed project as no major construction activities are required.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to cultural resources are not expected to occur due to implementation of the expedited BARCT requirements 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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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 known 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 on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?
- d) Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (1994) (formerly referred to as the Uniform Building Code), 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

California has 11 natural geologic regions, known as geomorphic provinces, which are defined by the presence of similar physical characteristics, such as relief, landforms, and geology. Most of the Bay Area is located within the natural region of California known as the Coast Ranges geomorphic province, with the eastern portions of Contra Costa and Alameda Counties extending into the neighboring Great Valley geomorphic province, located east of the Coast Ranges. The Coast Range, extends about 400 miles from Oregon south into Southern California, and is characterized by a series of northwest trending ridges and valleys that roughly parallel the San Andreas fault zone. The San Francisco Bay is a broad, shallow regional structural depression created from an east-west expansion between the San Andreas and the Hayward fault systems.

Much of the Coast Range province is composed of marine sedimentary and volcanic rocks located east of the San Andreas Fault. The regional west of the San Andreas Fault is underlain by a mass of basement rock that is composed of mainly marine sandstone and various metamorphic rocks. Marginal lands surrounding San Francisco Bay consist generally of alluvial plains of low relief that slope gently towards the bay from bordering uplands and foothills (ABAG, 2017). 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 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 tectonic plate boundary marked by the San Andreas 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). The San Andreas and the Hayward faults are the two faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. These two faults are classified as strike-slip faults that have experienced movement within the last 150 years. Other principal faults capable of producing significant ground shaking in the Bay Area are included in Table 2-3, and include the Rodgers Creek-Healdsburg, Concord-Green Valley, Marsh Creek-Greenville, San Gregorio-Hosgri, West Napa and Calaveras faults (ABAG, 2017). A major seismic event on any of these active faults could cause significant ground shaking and surface fault rupture. 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.

TABLE 2-3

Active Faults in the Bay Area

Fault	Recency of Movement	Maximum Moment Magnitude Earthquake
San Andreas	1989	7.9
Hayward	1868	7.1
Rodgers Creek-Healdsburg	1969	7.0
Concord-Green Valley	1955	6.9
Marsh Creek-Greenville	1980	6.9
San Gregorio-Hosgri	Late Quaternary	7.3
West Napa	2000	6.5
Maacama	Holocene	7.1
Calaveras	1990	6.8
Mount Diablo Thrust	Quaternary	6.7

(Source: ABAG, 2017)

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 reviewing procedures that will reduce losses from ground failure during future earthquakes.

Significance Criteria

The proposed project impacts on the geological environment will be considered significant if:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion of Impacts

VI a, c, and d). The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. New development potentially resulting in earthquake hazards is expected to be limited to the construction of air pollution control equipment or measures at industrial facilities. New construction (including modifications to existing structures) requires compliance with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code bases 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.

VI b). Construction associated with the proposed project is expected to be limited to air pollution control equipment at industrial facilities. All construction would take place at already existing facilities that have been previously graded. Thus, the proposed project is not expected to result in substantial soil erosion or the loss of topsoil as construction activities are expected to be limited to existing operating facilities that have been graded and developed, so that no major grading would be required.

VI e). Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. The expedited BARCT requirements would affect industrial

facilities that have existing wastewater treatment systems or which are connected to appropriate wastewater facilities and do not rely on septic tanks or similar alternative wastewater disposal systems. Based on these considerations, septic tanks or other alternative wastewater disposal systems are not expected to be impacted by the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to geology and soils are not expected to occur due to implementation of the expedited BARCT requirements 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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VII. GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE. Would the project:

- | | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) | Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" 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 checked="" type="checkbox"/> | <input type="checkbox"/> |

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 climate change is caused primarily by an increase in levels of greenhouse gases (GHGs) in the atmosphere. The major greenhouse gases are the so-called “Kyoto Six” gases – carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs) – as well as black carbon.¹ These greenhouse gases absorb longwave radiant energy (heat) reflected by the earth, which warms the atmosphere in a phenomenon known as the “greenhouse effect.” The potential effects of global climate change include rising surface temperatures, loss in snow pack, sea level rise, ocean acidification, more extreme heat days per year, and more drought years.

Increases in the combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) since the beginning of the industrial revolution have resulted in a significant increase in atmospheric levels of greenhouse gases. CO₂ levels have increased from long-term historical levels of around 280 ppm before the mid-18th century to over 400 ppm today. This increase in greenhouse gases has already caused noticeable changes in the climate. The average global temperature has risen by approximately 1.4°F (0.8°C) over the past one hundred years, and 16 of the 17 hottest years in recorded history have occurred since 2001, according to the National Oceanic and Atmospheric Administration.

Total global greenhouse gas emissions contributing to climate change are in the tens of billions of metric tons of CO₂e (carbon dioxide equivalent) per year. The State of California alone produces about two percent of the entire world’s GHG emissions with major emitting sources including fossil fuel consumption from transportation (37 percent), electricity production (20 percent), industry (24 percent), agricultural and forestry (8 percent), residential activities (6 percent), and commercial activities (5 percent) (ABAG, 2017). The Bay Area’s contribution to the global total is approximately 85 million tons

¹ Technically, black carbon is not a gas but is made up of solid particulates or aerosols. It is included in the discussion of greenhouse gas emissions because, like true greenhouse gases, it is an important contributor to global climate change.

per year. Transportation sources generate approximately 40 percent of the total GHG emissions in the Bay Area, with the remaining 60 percent coming from stationary and area sources (BAAQMD, 2017).

Regulatory Background

California has committed to reducing its greenhouse gas emissions to 1990 levels by 2020, to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. This commitment was enacted in AB 32, the Global Warming Solutions Act of 2006, which adopted the 2020 target; in 2016's SB 32 (Pavley), which adopted the 2030 target; and in Executive Order S-3-05, which adopted the 2050 target. The Air District has adopted the same 80 percent reduction target for 2050 for the Bay Area's greenhouse gas emissions, in Board of Directors Resolution 2013-11.

To achieve these emission reduction goals, the California legislature directed the California Air Resources Board (CARB) to develop a Scoping Plan setting forth regulatory measures that CARB will implement, along with other measures, to reduce the state's greenhouse gas emissions. One of the principal regulatory measures is CARB's Cap and Trade program, which requires industrial greenhouse gas sources to obtain "allowances" equal to their greenhouse gas emissions. The amount of available allowances is subject to a "cap" on total emissions statewide, which CARB will reduce each year. Regulated facilities will either have to reduce their emissions or purchase allowances on the open market, which will give them a financial incentive to reduce emissions and will ensure that total annual emissions from the industrial sector will not exceed the declining statewide cap.

California has also adopted the "Renewable Portfolio Standard" for electric power generation, which requires that at least 33 percent of the state's electric power must come from renewable sources by 2020, and at least 50 percent must come from renewables by 2030. To complement these efforts on electricity generation, the state has also committed to increasing the energy efficiency of existing buildings by 50 percent by 2050 in order to reduce energy demand.

California has adopted regulatory measures aimed at reducing greenhouse gas emissions from mobile sources. These measures include standards for motor vehicle emissions and the state's Low Carbon Fuel Standard, which set limits on the carbon intensity of transportation fuels. California has also adopted SB 375, the Sustainable Communities and Climate Protection Act of 2008, which requires regional transportation and land use planning agencies to develop coordinated plans, called "Sustainable Communities Strategies," to reduce greenhouse gas emissions from the transportation sector by promoting denser development and alternatives to driving. The current Sustainable Communities Strategy for the Bay Area is *Plan Bay Area 2040*, which was adopted by the Metropolitan Transportation Commission and the Association of Bay Area Governments in July of 2017.

The Air District has committed to reducing the Bay Area's regional greenhouse gas emissions to 80 percent below 1990 levels by 2050, as noted above. The Air District has also committed to a broad suite of specific measures to address greenhouse gases in the 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. That document lays out the Air District's vision for what the Bay Area may look like in a post-carbon year 2050 and describes policies and actions that the region needs to take in the near- to mid-term to achieve these goals.

Significance Criteria

CEQA Guidelines section 15064.4, promulgated in 2010, sets out the procedures for determining the significance of a project's greenhouse gas emissions. In making that determination, subdivision (b)(3) of that section allows a lead agency to consider “[t]he extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.”

In 2011, California Air Resources Board promulgated the regulations establishing the Cap and Trade Program (Cal. Code Regs., tit. 17, §§ 95801–96022) to reduce greenhouse gas emissions under the California Global Warming Solutions Act of 2006. The Cap and Trade Program seeks to reduce emissions of greenhouse gases from the subject sources by applying an aggregate greenhouse gas allowance budget on covered entities and providing a trading mechanism for greenhouse gas emission allowances or offsets. (Cal. Code Regs., tit. 17, § 95801.) Cap and Trade constitutes a “plan for the reduction . . . of greenhouse gas emissions” within the meaning of Guidelines section 15064.4, subdivision (b)(3), and that section therefore authorizes agencies to determine a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap and Trade Program. (*Association of Irrigated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal. App. 5th 708, 743.)

Discussion of Impacts

VII. a). While the primary purpose of implementing expedited BARCT requirements is to reduce emissions of ROG, NO_x, SO₂, and PM, some types of control equipment have the potential to create secondary adverse air quality impacts and generate GHG emissions, through construction activities or through the addition of air pollution control equipment. The proposed BARCT requirements may result in the installation of new equipment at facilities that need to comply with the new requirements.

Limited construction activities may be required for some BARCT measures to enclose open fugitive components, install new catalyst, increase lime injection, and so forth. Construction emissions associated with this type of construction would be minor and would involve the transport of the new equipment which is expected to require one to two truck trips per project. Installation of the equipment would be expected to be limited to two to ten workers and would not require any major construction equipment and no site preparation activities are expected to be required. Therefore, retrofitting this type of existing equipment would result in minor construction emissions.

Construction activities would also be required for the construction of new air pollution control equipment at existing facilities, including vapor combustors, wet gas scrubbers, ESPs, vapor recovery systems, and SCRs. Some of the BARCT equipment would be required at existing facilities with large emission sources, e.g., refinery FCCUs. Construction activities for these types of new air pollution control equipment would be temporary. Each of the sources that might be subject to the BARCT requirements set out in the expedited schedule is subject to the Cap and Trade Program and its greenhouse gas emissions are required to comply with the requirements of the Cap and Trade Program. As a result, the greenhouse gas emissions resulting from the implementation of the expedited BARCT schedule will be less than significant.

VII. b). The facilities affected by the expedited BARCT requirements could require the installation of additional air pollution control equipment or the implementation of new measures to control criteria pollutants. These measures could generate additional GHG emissions. However, the facilities subject to expedited BARCT must comply with the Cap and Trade Program, an obligation the implementation of the expedited BARCT schedule will not change. The GHG emissions resulting from the implementation of the BARCT schedule will therefore have a less-than-significant impact.

Conclusion

Based upon the above considerations, significant adverse impacts related to greenhouse gas emissions and climate change are not expected to occur due to implementation of the expedited BARCT requirements 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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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) 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"/> |
| g) 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"/> |
| h) Significantly increased fire hazard in areas with flammable materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Setting

The Air District covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses.

Facilities and operations within the District handle and process substantial quantities of flammable materials and acutely toxic substances. 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 come into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

For all affected facilities, risks to the public are reduced if there is a buffer zone between industrial processes and residences or other sensitive land uses, or the prevailing wind blows away from residential areas and other sensitive land uses. The risks posed by operations at each facility are unique and determined by a variety of factors. The facilities affected by the proposed new rules are 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 are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. California proposed modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The proposed regulations were released for public comment on July 15, 2016 and the public comment period closed on September 15, 2016. After the close of the comment period a modified version of the proposed regulations was released in February 2017 and the public comment period for comments on the modifications closed on March 30, 2017. The final document was then filed with the Secretary of State in July 2017 and has gone into effect as of October 1, 2017.

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.

Significance Criteria

The proposed project impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Discussion of Impacts

VIII a, b, and c. The expedited BARCT implementation schedule would require certain industrial facilities, including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners, to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. SCRs could potentially be installed to control NOx emissions. Installation of new SCR equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional delivery of ammonia or urea to the facilities where they are installed. Ammonia is a hazardous material that can be released in liquid or gaseous form. Additional catalysts could be required for SCR units and sulfur reducing catalyst additives may be required for SO₂ control. Alkaline may be required for alkaline and lime injection systems. The potential increase in the storage, transport and use of ammonia, catalysts, catalyst additives, and alkaline materials could result in significant hazard impacts which will be further evaluated in the Draft EIR.

Hazards associated with 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, which may contribute to a fire or explosion.

Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in an emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

- Types of hazardous materials used and their locations;
- Training programs for employees including safe handling of hazardous materials and emergency response procedures and resources;
- Procedures for emergency response notification;
- Proper use of emergency equipment;
- Procedures to mitigate a release or threatened release of hazardous materials and measures to minimize potential harm or damage to individuals, property, or the environment; and
- Evacuation plans and procedures.

Hazardous materials at existing facilities would continue to be used in compliance with established by the California Occupational Safety and Health Administration (Cal-OSHA) regulations and procedures, including providing adequate ventilation, using recommended personal protective equipment and clothing, posting appropriate signs and warnings, and providing adequate worker health and safety training. The exposure of employees is regulated by Cal-OSHA in Title 8 of the CCR. Specifically, 8 CCR 5155 establishes permissible exposure levels (PELs) and short-term exposure levels (STELs) for various chemicals. These requirements apply to all employees. The PELs and STELs establish levels below which no adverse health effects are expected. These requirements protect the health and safety of the workers, as well as the nearby population including sensitive receptors.

In general, all local jurisdictions and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area.

The above regulations provide comprehensive measures to reduce hazards of explosive or otherwise hazardous materials. Compliance with these and other federal, state and local regulations and proper operation and maintenance of equipment should ensure the potential for explosions or accidental releases of hazardous materials is not significant.

Despite the measures listed above, a malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The transport, use, and storage of additional hazardous materials may result in a release in the event of an accident. As a result, hazard impacts related to hazards to the public, schools, or the environment 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. Most of the refineries affected by the expedited BARCT requirements are included on the hazardous materials sites list pursuant to Government Code §65962.5. It would be expected that other industrial facilities affected by the BARCT requirements would also be on the list. The facilities affected by the proposed BARCT requirements would be required to continue to manage any and all hazardous materials in accordance with federal, state, and local regulations. Implementing BARCT requirements are not expected to interfere with site cleanup activities or create additional site contamination. As a result, the proposed project is not expected to affect any facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.

VIII e-f. The proposed project is not expected to result in a safety hazard for people residing or working within two miles of a public airport or air strip. No impacts on airports or airport land use plans are anticipated from the proposed expedited BARCT requirements. Modifications to industrial facilities to install BARCT would be confined to the existing industrial area and would not be expected to interfere with airport activities. The hazards associated with the potential use of additional hazardous materials will be evaluated in the Draft EIR as discussed above.

VIII g-h. No increase in hazards associated with wildfires is anticipated from implementation of expedited BARCT. Affected facilities 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. The proposed project would not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees, nor would it increase fire risk by increasing the use of flammable materials. It is expected that facilities adjacent to wildland areas take appropriate and required actions to protect their property from wildland fires. The proposed project requirements are not expected to expose people or structures to wild fires. Therefore, no significant increase in fire hazards is expected due to the proposed expedited BARCT requirements.

Conclusion

Implementation of the expedited BARCT requirements would reduce criteria pollutant emissions from industrial facilities throughout the Bay Area. However, construction and operation of new air pollution control equipment have the potential to result in an increase in the storage, transport and use of hazardous materials in the Bay Area and will be evaluated in the Draft EIR. No significant impacts were identified for sites included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5, projects located within or adjacent to airports or airport land use plans, emergency response plans, wildland fires, and hazards associated with flammable materials 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 on- or off-site? | <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 storm water drainage systems or provide substantial additional sources of polluted runoff? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input 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 loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| j) | Inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Setting

The Air District 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). Reservoirs and drainage streams are located throughout the area within the Air District’s jurisdiction, and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of California. Water from the Sacramento and San Joaquin Rivers of the Central Valley flow into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate strait. The Delta is a large triangle of interconnected sloughs and agricultural “islands” that forms a key link in California’s water delivery system. Some of the fresh water flows through the Delta and into Bay, but much is diverted from the Bay for agricultural, residential, and industrial purposes, as well as delivery to distant cities of southern California as part of state and federal water projects (ABAG, 2017).

The two major drainages, the Sacramento and San Joaquin Rivers receive more than 90 percent of runoff 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 of which seven border the Bay. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. 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 (ABAG 2017).

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 Bridge 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 (ABAG, 2017).

The Bay Area region is divided into a total of 28 groundwater basins. The ten primary groundwater basins in the Bay Area are the Petaluma Valley, Napa-Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, Sunol Valley, and Santa Clara Valley basins. Groundwater in the region 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 (ABAG, 2017).

Together, surface water and ground water supply approximately 31 percent of Bay Area water. Surface water from local rivers and streams (including the Delta) is an important source for all Bay Area Water agencies, but particularly in the North Bay counties, where access to imported water is more limited because of infrastructure limitations. The greatest proportion of Bay Area water is imported from Sierra Nevada and Delta sources, comprising approximately 66 percent of supply. The primary Sierra Nevada sources are the Mokelumne River and Tuolumne River watersheds. Several Bay Area water agencies receive Delta water through the State and Central Valley Water Projects, which comprise a vast network of canals and aqueducts for the delivery of water throughout the Bay Area and the Central Valley (ABAG, 2017).

Recycled water in the Bay Area has come to be widely used for a number of applications, including landscape irrigation, agricultural uses, commercial and industrial purposes, and as a supply to the area's wetlands. The Alameda County Water District operates the Newark Desalination Facility which supplies approximately 12.5 million gallons per day to the distribution system (ABAG, 2017).

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and towns wastewater treatment systems. Some treatment plants serve individual cities while others serve multiple jurisdictions. More than 50 agencies provide wastewater treatment throughout the Bay Area. Most industrial facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of National Pollutant Discharge Elimination System (NPDES) permits.

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 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 Regional Water Quality Control Boards administer the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

In response to the Federal Act, the State Water Resources Control Board prepared two statewide plans in 1991 and 1995 that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan, which have been updated in 2005 as the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. San Francisco Bay, and its constituent parts, including Carquinez Strait and Suisun Bay, fall under this category.

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

Significance Criteria

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 263,000 gallons per day of potable water.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Discussion of Impacts

IX a, b, and f. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. While water may be used for dust suppression, substantial earthmoving would not be required. Therefore, significant water use would not be associated with construction activities.

The operation of some types of air pollution control equipment does not require the use of water or generate wastewater discharge, for example SCRs do not require the use of water and are not expected to result in any increase in wastewater. However, the use of wet gas scrubbers and wet ESPs do require additional water use. The proposed project would be considered significant if it exceeded the CEQA threshold of 263,000 gallons or more of potable water per day. Wet gas scrubbers on a refinery FCCU can require substantial water use in excess of 263,000 gallons per day and would result in additional wastewater discharge. Therefore, the potential impacts of water use and wastewater discharge will be evaluated in the Draft EIR.

VIII c, d, and e. Compliance with expedited BARCT requirements is expected to be limited to the installation of air pollution control equipment and modifications to industrial facilities. All activities associated with the proposed project are expected to occur within the confines of existing industrial facilities. 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 the confines of existing industrial facilities that have already been graded. In addition, storm water drainage within the facilities is currently controlled and construction activities are not expected to alter the storm water drainage within these facilities. Therefore, the BARCT measures are not expected to substantially alter the existing drainage or drainage patterns, result in erosion or siltation, alter the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Additionally, the proposed project is 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 as a result of the proposed project.

VIII 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”). The facilities affected by BARCT are industrial facilities. Any new construction associated with the proposed project is expected to occur within the confines of existing industrial facilities. 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.

Conclusion

Implementation of the expedited BARCT requirements would reduce criteria pollutant emissions from industrial facilities throughout the Bay Area. However, construction and operation of new air pollution control equipment has the potential to result in an increase in water use and wastewater

discharge associated with new air pollution control equipment and will be evaluated in the Draft EIR. No significant impacts were identified for storm water runoff and drainage, flood hazards, or the risks of inundation by seiche, tsunami or mudflow 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
X. LAND USE AND PLANNING. 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 Air District 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 land uses surrounding the Bay margins tend to be more intensely developed, particularly from San Francisco south along the Peninsula to Santa Clara County, and Contra Costa County south through Alameda County to Santa Clara County. These areas also include extensive networks of open space. The counties north of the Bay (Marin, Sonoma, and Napa) are more sparsely developed with a combination of suburban development, smaller cities and towns, and agriculture defining the landscape. Other areas of the Bay Area, such as the East Bay and Solano County, tend to be more suburban in character, with heavy industry related to oil refineries dotting the landscape as well as agriculture (ABAG, 2017).

Approximately 18 percent of the region’s 4.8 million acres are considered to be urban or built-up land according to the California Farmland Mapping and Monitoring Program. The remaining undeveloped area includes open space and agricultural lands as well as water bodies and parks. Approximately 29 percent of the region is identified as protected open space. The Bay Area includes 101 cities, with San Jose, San Francisco, and Oakland representing the largest urbanized centers (ABAG, 2017).

Regulatory Background

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

Significance Criteria

The proposed project impacts will be considered significant on land use and planning if the project conflicts with the land use and zoning designations established by local jurisdictions, or any applicable habitat conservation or natural community conservation plan.

Discussion of Impacts

X a-c. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Thus, the proposed project is not expected to have impacts to non-industrial land uses and would not result in impacts that would physically divide an established community.

The General Plans and land use plans for areas with industrial land uses, generally 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 refineries (Benicia, 2015 and Santa Clara, 2011). The construction of equipment within the confines of existing facilities is not expected to conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the facilities that would be required to implement BARCT. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The construction required to comply with BARCT requirements that would be imposed by the proposed project would not interfere with those land use policies or objectives.

The proposed project has no components which would affect land use plans, policies, or regulations. Regulating emissions from existing facilities, will not require local governments to alter land use and other planning considerations. Habitat conservation or natural community conservation plans, agricultural resources or operations would not be affected by the proposed project, and divisions of existing communities would not occur. Therefore, current or planned land uses within the District will not be significantly affected as a result of the proposed project.

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 the expedited BARCT requirements 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
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"/>

Setting

The Air District 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.

Regulatory Background

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

Significance Criteria

The proposed project impacts on mineral resources will be considered significant if:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion of Impacts

XI a-b. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Construction of air pollution control equipment and modifications to existing industrial facilities as a result of the proposed project is not expected to affect mineral resources. Construction and operation of new equipment associated with proposed project is not expected to require mineral resources that are of value to the region or result in the loss of a locally important mineral resource site. Thus, no significant adverse impacts to 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 the expedited BARCT requirements 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
XII. NOISE. 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 ambient noise environment in the urban areas of the Bay Area is defined by a wide variety of noise sources, with the predominant noise source being traffic. Traffic noise exposure is primarily a function of the volume of vehicles per day, the speed of those vehicles, the type of ground surface, the number of those vehicles represented by medium and heavy trucks, the distribution of those vehicles during daytime and nighttime hours, and the proximity of noise-sensitive receivers to the roadways. Existing average traffic noise exposure ranges from 52.1 decibels (dBA) (next to collector and small roads) to as high as 75.9 dBA (next to freeways). Bus transit also contributes to roadway noise levels. In San Francisco, a large portion of the transit bus fleet is electrified and, consequently, the contribution of bus transit to localized roadway noise levels is decreased (ABAG, 2013).

The Bay Area is also presently affected by noise from freight and passenger rail operations. While these operations generate significant noise levels in the immediate vicinity of the railways, train operations are intermittent and area railways are widely dispersed. Commuter rail such as San Francisco Muni Metro and Santa Clara Valley Transportation Authority (VTA) operate with more frequency than standard gauge rail operations but lower speeds resulting in lower noise levels. Bay Area Rapid Transit (BART) operations, on the other hand, can attain higher speeds and have the potential for greater noise levels along extended stretches. Noise levels from rail operations in the Bay Area can range from 70 dBA to 82 dBA, Community Noise Equivalent Level (CNEL). Train operations may be a source of ground vibration near the tracks. (ABAG, 2017).

The Bay Area is home to many airports—including public use, private use, and military facilities. Major airports include San Francisco International, Oakland International and Norman Y. Mineta San José International. In addition to the numerous daily aircraft operations originating and terminating at these facilities, aircraft not utilizing these airports frequently fly over the Bay Area. All of these operations contribute to the overall ambient noise environment. In general, like rail noise, the proximity of the receiver to the airport and aircraft flight path determines the noise exposure. Other contributing factors include the type of aircraft operated, altitude of the aircraft, and atmospheric conditions. Atmospheric conditions may contribute to the direction of aircraft operations (flow) and affect aircraft noise propagation (ABAG, 2017).

Based on the adopted Airport Land Use Compatibility Plan (ALUCP) for San Francisco International Airport, the 65 dBA CNEL contour extends approximately 6 miles northwest of the airport. Based on the ALUCP for Oakland International Airport, the 65 dBA CNEL contour extends approximately 5 miles south of the airport. Based on the ALUCP for Mineta San Jose International Airport, the 65 dBA CNEL contour extends approximately 2.5 miles northwest from the airport. Many other smaller airports and airstrips exist within the Bay Area where widely varying noise levels contribute to the existing noise environment (ABAG, 2017).

A wide variety of industrial and other non-transportation noise sources are located within the Bay Area. These include manufacturing plants, landfills, treatment plants (e.g., water), power generation facilities, food packaging plants, lumber mills, and aggregate mining facilities, just to name a few. Noise generated by these sources varies widely, but in many cases may be a significant, if not dominant, contributor to the noise environment in a specific community (ABAG, 2017).

Regulatory Background

Noise levels 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.

Significance Criteria

The proposed project impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise ordinance is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion of Impacts

XII a, c, and d. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial structures. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. Construction required for the installation of air pollution control equipment or facility modifications is not expected to significantly alter the existing noise of an industrial facility. Construction activities associated with the proposed project would generate temporary noise associated with construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities would be temporary, would occur during daylight hours or within hours established under the local noise ordinance, and would occur within the confines of existing industrial facilities so that no significant increase in noise during construction activities is expected.

Air pollution control equipment is not generally a major noise source. The equipment would be located within heavy industrial areas and compatible with such uses. Further, all noise producing equipment must comply with local noise ordinances and applicable OSHA and Cal/OSHA noise requirements. Therefore, industrial operations affected by the expedited BARCT requirements are not expected to have a significant adverse effect on local noise levels or noise ordinances.

XII b. The proposed project is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. The use of large construction equipment that would generate substantial noise or vibration (e.g., backhoes, graders, jackhammers, etc.) would be limited because the sites are already graded and developed. Further, construction activities are temporary and would occur during the daylight hours, in compliance with local noise standards and ordinances. Therefore, the proposed project is not expected to generate excessive groundborne vibration or noise.

XII e-f. Affected facilities would still be expected to comply, and not interfere, with any applicable airport land use plans. It is assumed that operations in these areas near airports are subject to and in

compliance with existing community noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. In addition to noise generated by current operations, noise sources in each area may include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses. None of the proposed BARCT measures would locate residents or commercial buildings or other sensitive noise sources closer to airport operations. There are no components of the proposed BARCT measures that would substantially increase ambient noise levels within or adjacent to airports. Therefore, these topics will not be further evaluated in the EIR.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts on noise are not expected to occur due to implementation of the expedited BARCT requirements 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
XIII. POPULATION AND HOUSING. 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 Air District 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 expedited BARCT requirements would apply to facilities which are located within industrial areas of the Bay Area.

Population in the Bay Area in 2015 was about 7.6 million people, which is approximately 20 percent of California’s population. The population of the Bay Area is expected to grow to about 9.6 million people by 2040. Approximately 4 million people in the Bay Area were employed in 2015, and that number is expected to grow to 4.7 million jobs by 2040. There were approximately 2.8 million households in the Bay Area in 2015, and the number of households is expected to increase to 3.4 million by 2040 (ABAG, 2017).

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.

Significance Criteria

The proposed project impacts on population and housing will be considered significant if:

- The demand for temporary or permanent housing exceeds the existing supply.

- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion of Impacts

XIII a). According to ABAG, population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). 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 project will require construction activities to modify existing operations and/or install air pollution control equipment at existing industrial facilities. It is expected that the existing labor pool would accommodate the labor requirements for the construction of the new and modified industrial equipment. In addition, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment. In the event that 1-2 new employees are hired, the existing local labor pool in the District (over seven million people) can accommodate any increase in demand for workers that might occur as a result of adopting the expedited BARCT requirements. As such, adopting the expedited BARCT requirements is not expected to induce substantial population growth.

XIII b and c). As discussed previously, the proposed expedited BARCT requirements are designed to reduce criteria pollutant emissions from stationary sources in the Bay Area. Construction associated with the proposed project is expected to be limited to constructing new air pollution control equipment or facility modifications at industrial facilities. All construction would take place at existing industrial facilities. The implementation of the expedited BARCT requirements is not expected to result in the creation of any industry/business that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the Bay Area. Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to population and housing are not expected to occur due to implementation of the expedited BARCT requirements 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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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"/>

Setting

The Air District 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.

Public services are provided by a wide variety of local agencies. Fire protection services are managed at the local level, typically by municipalities, counties, fire protection districts, or volunteer fire companies. California Government Code §38611 states that any city organized under general law must establish a fire department unless it is included within the boundaries of an established fire protection district. State and federal lands are generally served by State and federal fire agencies, e.g., CALFIRE and National Park Service. In some cases, businesses and native Tribes manage their own fire departments. Each fire protection agency is responsible for serving its own prescribed area, but mutual aid agreements are in wide use across the region such that agencies can rely on assistance from neighboring agencies in the case of overwhelming demand (ABAG, 2017).

Police services are provided on the State, county, and local levels. Police services provide law enforcement in crime prevention, traffic and congestion control, safety management, emergency response, and homeland security. The California Highway Patrol (CHP) is responsible for police protection along the interstate highway systems and provides services for traffic management, emergency response, and protection of the highway system. Each county in the Bay Area has its own sheriff’s department responsible for police protection in unincorporated areas of each county. Each incorporated city and town has a police department responsible for police protection within its own jurisdiction. Unincorporated areas and individual cities and towns also may contract with county sheriff departments for police services instead of providing their own (ABAG, 2017).

Although the California public school system is under the policy direction of the Legislature, the California Department of Education relies on local control for the management of school districts. School district governing boards and district administrators allocate resources among the schools of the district and set education priorities for their schools. Each jurisdiction in the Bay Area provides residents with local public education facilities and services, including elementary, middle, secondary, and post-secondary schools, as well as special and adult education. As of 2015-2016 school year, there were 2,018 public and charter schools in the Bay Area with 1,019,853 enrolled students and 51,702 teachers (ABAG, 2017).

Public facilities within the Air District are managed by different county, city, and special-use districts.

Regulatory Background

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

Significance Criteria

The proposed project impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion of Impacts

XIV a. As noted in the “Population and Housing” discussion above, the proposed project is not expected to induce population growth because the existing local labor pool (e.g., workforce) is sufficient to accommodate the expected construction work force. No increase in permanent workers is expected to be required to operate the equipment associated with the expedited BARCT requirements. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

The proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. The facilities affected by the proposed project are existing facilities for which public services are already required and no increase in the need for such services is expected. Furthermore, a number of industrial facilities have existing security and fire-fighting capabilities, e.g., refineries, and are able to respond to fire and security issues independent of public police and fire services. There will be no increase in population as a result of the adoption of the expedited BARCT schedule and, therefore, no need for physically altered government facilities.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts on public services are not expected to occur due to implementation of the expedited BARCT requirements 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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XV. RECREATION.

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| <p>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?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>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?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
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Setting

The Air District covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. The Bay Area contains approximately 1.3 million acres of parks and open space areas, with Santa Clara County having the most (about 19%) followed by Sonoma County (17%), and Marin County (16%). Approximately 265,000 acres of new parkland were added to the regional’s open space inventory between 2002 and 2013, representing a 26 percent increase. Additionally, approximately 200,000 acres of privately owned land are held in permanent reserve as of 2013. While access by the general public to these reserve areas is restricted, they are important for the preservation of wildlife habitats and the protection of the environment and rural characteristics of various parts of the region (ABAG, 2017).

Parks and open space are generally categorized according to their size and amenities. Smaller parks such as pocket parks, neighborhood parks, community parks, urban forests, and community gardens serve local communities, typically are located in urbanized areas, and often include a wide range of improvements from playing fields and picnic areas to playgrounds and fitness trails. These parks are most often managed by local park districts or municipalities, which typically set minimum standards for park acreage based on their population. Larger open space areas such as regional parks, greenbelts, trails and pathways, natural and wildlife preserves, state parks and federal parks serve a broader geographic range, typically are located outside of major urbanized areas, and generally include fewer improvements. Management of these parks is divided among a range of organizations and agencies including regional park districts, State and federal government, private individuals, and non-profit land trusts.

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.

Significance Criteria

The proposed project impacts on recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion of Impacts

XV a-b. As discussed under “Land Use” above, there are no provisions in the expedited BARCT requirements 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 BARCT requirements. Construction associated with the proposed project is expected to be limited to air pollution control equipment and modifications to existing industrial facilities and would employ temporary construction workers. All construction would take place at existing facilities that have been previously graded. Further, no increase in permanent workers is expected at the facilities where BARCT would be installed. Thus, there would be no increase in population that would result in more frequent use of recreational facilities.

The proposed project would not increase or redistribute population and, therefore, would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities. Therefore, adoption of the expedited BARCT requirements is not expected to have any significant adverse impacts on recreation.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to recreational facilities are not expected to occur due to implementation of the expedited BARCT requirements 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
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 by 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 Air District 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. Transportation systems located within the Bay Area include railroads, airports, waterways, and highways.

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. These facilities provide access to major employment centers and to destinations outside of the Bay Area. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing localized access to individual communities. Together, these roadway facilities accommodate nearly 158 million vehicle miles each weekday. The road network also serves over 600,000 vehicles that travel into or out of the region from adjacent areas. Over half of these interregional travelers use two regional gateways: Interstate 80 connecting Solano County and Yolo County, and Interstate 580 and Interstate 205 connecting Alameda County and San Joaquin County (ABAG, 2017).

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.

There are over 11,500 transit route miles of service including heavy rail (BART), light rail (Muni Metro and Santa Clara Valley Transportation Authority or VTA Light Rail), commuter rail (Caltrain and Alameda Commuter Express or ACE), diesel and electric buses, cable cars, and ferries. This public transit system accommodates a total of almost 1.7 million passengers a day, with about 53 percent of daily passengers on Muni Metro, about 26 percent of daily passengers on BART, 11 percent on AC Transit, and nine percent on VTA. Amtrak provides long-distance passenger rail services to the Bay Area via the Capitol Corridor, San Joaquin, Coast Starlight, and California Zephyr lines (ABAG, 2017).

In addition to public transit systems and operators, private transit options have been increasing including privately operated commuter shuttles (e.g., Apple and Google), publicly accessible private shuttles (e.g., Emery Go-Round and Chariot), and transportation network companies (e.g., Uber and Lyft) (ABAG, 2017).

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 65 percent in 2015. The portion of commuters that carpool was about 10 percent in 2015, while an additional 12 percent utilize public transit.

About two percent of commuters walked to work in 2015. In addition, other modes of travel (bicycle, motorcycle, etc.), account for five percent of commuters in 2015 (ABAG, 2017).

The Bay Area is served by five seaports, which provide the opportunity for intermodal transfers to truck and railcars. The Port of Oakland is the third largest U.S. seaport on the West Coast (after the Ports of Long Beach and Los Angeles). Other seaports include the Port of San Francisco, the Port of Richmond, the Port of Benicia, and the Port of Redwood City. These seaports are supported by freight railroad services operated by Union Pacific and Burlington Northern Santa Fe.

The Bay Area is also served by three international airports: San Francisco International Airport, Oakland International Airport, and Norman Y. Mineta San Jose International Airport. Each of these airports provides mobility for people and freight nationally and internationally. The region is also served by one smaller airport with limited commercial service, Charles M. Schulz Sonoma County Airport, as well as numerous small general aviation airports.

Regulatory Background

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

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

Significance Criteria

The proposed project impacts on transportation and traffic will be considered significant if:

- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

Discussion of Impacts

XVI a and b. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources,

wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial structures.

Construction activities associated with the proposed project would generate temporary noise associated with construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities and related traffic would be temporary, would occur during daylight hours, would occur within the confines of existing industrial facilities, and would cease following the completion of construction. As discussed in “Population and Housing” above, the labor force in the Bay Area is sufficient to handle the temporary increase in construction-related jobs. No increase in permanent workers is expected due to the installation of additional air pollution control equipment or facility modifications. The installation of some air pollution control equipment, e.g., SCRs and wet gas scrubbers, could result in an increase of about 1-2 trucks per week to deliver ammonia, catalyst or alkaline materials to the facilities for the operation of the equipment. The increase in one truck per day would be a negligible increase in traffic in the Bay Area.

The proposed project is not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths, as no increase in permanent workers is expected. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways are expected. No changes are expected to parking capacity at or in the vicinity of affected facilities as the proposed project only pertains to equipment located within existing industrial facilities. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

XVI c. The expedited BARCT requirements are not expected to involve the delivery of materials via air so no increase in air traffic is expected. Construction associated with the proposed project is expected to be limited to air pollution control equipment and modifications at existing industrial facilities. All construction would take place at existing industrial facilities. Therefore, the proposed project would not result in a change in air traffic patterns or result in a change in location that results in substantial safety risks.

XVI d - e. The proposed expedited BARCT requirements would not increase traffic hazards or create incompatible uses. The proposed project does not involve construction of any roadways or other transportation design features, so no changes to current roadway designs that would increase traffic hazards are expected. Emergency access at industrial facilities affected by the expedited BARCT requirements is not expected to be impacted by the proposed project, as no modifications that effect traffic or access are expected to be required. The expedited BARCT requirements are not expected to increase vehicle trips or to alter the existing long-term circulation patterns, thus creating traffic hazards or impacting emergency access.

XVI f) The proposed expedited BARCT requirements are not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths as construction associated with the proposed project is expected to be limited to existing industrial facilities. Implementation of expedited BARCT requirements could result in a temporary increase in traffic at these industrial facilities during the construction period and one or two delivery trucks per week. No increase in permanent workers is expected following the construction period. Therefore, the proposed project would not conflict with any congestion management programs or other plans, increase travel demand, impact public transit, or impact bicycle or pedestrian safety. No changes are expected to parking capacity at or in the vicinity of affected facilities as the BARCT requirements are not expected to require additional permanent employees. Therefore, no impacts resulting in changes to traffic patterns or adopted traffic plans or programs are expected.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to traffic and transportation are not expected to occur due to implementation of the expedited BARCT requirements 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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XVII. TRIBAL CULTURAL RESOURCES.

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resourced Code section 5020.1(k), or | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Setting

The Air District 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. Tribal cultural resources include site features, places, cultural landscapes and sacred places or objects which are of cultural value to a Tribe. The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. Dense concentrations of Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. In addition, archaeological sites have also been identified in the following environmental settings in all Bay Area counties: near water sources, such as vernal pools and springs; along ridgetops and on midslope terraces; and at the base of hills and on alluvial flats. Native American archaeological sites have also been identified in the inland valleys of all Bay Area counties. Remains associated with a Native American archaeological site may include chert or obsidian flakes, projective points, mortars and pestles, and dark friable soil contain shell and bone dietary debris, heat-affected rock, or human burials (ABAG, 2017).

Native American populations, identified by their language, that lived within the Bay Area, included Costanoan, Eastern Miwok, Patwin, Coast Miwok, Pomo, and Wappo. Native villages and campsites were inhabited on a temporary basis and are found in several ecological niches due to the seasonal nature of their subsistence base. Remains of these early populations indicate that main villages, seldom more than 1,000 residents, were usually established along water courses and drainages. By the late 1760s, about 300,000 Native Americans lived in California (ABAG, 2013).

Regulatory Background

The State CEQA Guidelines were amended in July 2015 to include evaluation of impacts on tribal cultural resources. Tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe (Public Resources Code 21074).

Significance Criteria

The proposed project impacts to tribal resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of Tribal cultural significance to a community or ethnic or social group or a California Native American Tribe.
- Unique objects with cultural value to a California Native American Tribe are present that could be disturbed by construction of the proposed project.

Discussion of Impacts

XVII a). As discussed in Section V, Cultural Resources, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The proposed expedited BARCT requirements may require the construction of air pollution control equipment and facility modifications to industrial facilities, adjacent to existing industrial structures. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3), are not listed or eligible for listing in the California Register of Historic Resources or a local register of historical resources (Public Resources Code Section 5020.1(k), and are not considered to have cultural value to a California Native American Tribe.

Further, construction associated with the proposed project is expected to be limited to the construction at industrial facilities. All construction would take place at existing facilities that have been previously graded. Because construction will be limited to facilities that have been graded, the proposed expedited BARCT requirements are not expected to require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. The proposed BARCT requirements are not expected to result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources.

As part of releasing this CEQA document for public review and comment, the document is circulated to the State Clearinghouse that provides notice of the proposed project to all California Native American Tribes that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code § 21080.3.1(b)(1). The NAHC notification list provides a 30-day period during which Native American Tribes may respond to the notice, in writing, requesting consultation on the proposed expedited BARCT requirements.

Since construction activities will be limited to existing industrial facilities that have been previously graded and developed, the proposed expedited BARCT requirements are not expected to affect historical or tribal resources as defined in Public Resources Section 5020.1(k), or 5024.1. Therefore, no impacts to tribal resources are anticipated to occur as a result of the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to tribal cultural resources are not expected to occur due to implementation of the expedited BARCT requirements 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
XVIII. UTILITIES/SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input 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

Given the large area covered by the Air District, public utilities are provided by a wide variety of local agencies. The San Francisco Bay Hydrologic Region covers approximately 4,550 square miles and encompasses numerous individual watersheds that drain into the San Francisco Bay and directly into the Pacific Ocean. Water is supplied to affected facilities by water purveyors in the Bay Area, which include the Alameda County Water District, Contra Costa Water District, East Bay Municipal District, Marin Municipal Water District, Napa Water Department, San Francisco Public Utilities Commission, Santa

Clara Valley Water District, Solano County Water Agency, Sonoma County Water Agency, and the Zone 7 Water Agency.

Solid waste includes the garbage, refuse and other discarded solid materials generated by residential, commercial, and industrial activities. Solid waste is handled through a variety of municipalities, through recycling activities and at disposal sites. The Bay Area is currently served by 16 privately operated landfills and one operated by the Sonoma County Public Works Department. The 16 landfills have a total remaining capacity of 261,889,000 cubic yards, or a total daily throughput of 41,804 tons per day (ABAG, 2017).

There are no hazardous waste disposal sites within the jurisdiction of the Air District. Hazardous waste generated at facilities, which is not recycled off-site, is required to be disposed of at a licensed hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California.

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.

Significance Criteria

The proposed project impacts on utilities/service systems will be considered significant if:

- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- An increase in demand for utilities impacts the current capacities of the electric utilities.
- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.
- The project increases demand for water by more than 263,000 gallons per day.
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion of Impacts

XVIII a, b, d and e). The potential water use and wastewater impacts associated with implementation of the proposed expedited BARCT requirements were discussed under Hydrology and Water Quality (see Section IX a.). Certain types of air pollution control devices (e.g., wet gas scrubbers) could result in substantial water use and wastewater discharge. Therefore, these topics will be evaluated further in the Draft EIR.

XVIII c). Air pollution control equipment and facility modifications to implement the expedited BARCT requirements would occur within the confines of existing industrial facilities where stormwater is already controlled. The proposed project is not expected to require additional paving that would generate

additional stormwater runoff. Therefore, the proposed project would not be expected to alter the existing drainage systems or require the construction of new storm water drainage facilities. Nor would the proposed project 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.

XVIII f and g). Construction of air pollution control equipment as a result of the expedited BARCT requirements is not expected to significantly increase solid or hazardous wastes generated by the affected existing facilities. Some air pollution control equipment uses catalysts that need to be replaced when they are depleted. The catalyst is usually recycled because of the metal content of the catalyst and would not be expected to generate additional hazardous or solid waste that requires disposal. Waste streams from affected facilities would be treated/disposed/recycled in the same manner as they currently are handled. Therefore, no significant impacts to solid or hazardous waste disposal facilities are expected due to the proposed project. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

Conclusion

Based upon the above considerations, the potentially significant impacts associated with water use and wastewater treatment will be evaluated in the Draft EIR, as discussed in Section IX – Hydrology and Water Quality above. The potential project-specific impacts to other utilities and service systems are not expected to occur due to implementation of the expedited BARCT requirements 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
XIX. 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"/>

Discussion of Impacts

XIX a. The proposed expedited BARCT requirements are designed to reduce criteria pollutant emissions from industrial facilities in the Bay Area. Modifications may be required to industrial facilities to install air pollution control equipment. As discussed in Section IV, Biological Resources; Section V, Cultural Resources; and Section XVIII no significant adverse impacts are expected to biological, cultural, or tribal resources. The facilities affected by the expedited BARCT requirements are existing industrial facilities that have been graded and developed, where native biological resources have been removed or are non-existent. Similarly, impacts to cultural or tribal resources would not be expected to occur.

Therefore, the proposed expedited BARCT requirements 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. As discussed in Section IV, Biological Resources; Section V, Cultural Resources; and Section

XVII, Tribal Cultural Resources, no significant adverse impacts are expected to biological, cultural, or tribal cultural resources.

XIX b-c. The proposed expedited BARCT requirements are expected to result in a reduction in criteria pollutant emissions and implement portions of the AB 617 requirements, helping to achieve the goals of reducing ozone and PM in the Bay Area, thus improving public health and air quality in the region. As discussed in Section III, Air Quality, emissions during construction activities and operation could potentially exceed applicable significance thresholds, which represent levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions. (However, please see the discussion in Chapter 2, Section III, "Air Quality", above, regarding the applicability of the Air District's project-level CEQA thresholds to rule development projects.) The hazard associated with the additional use of ammonia and other potentially hazardous materials may also result in impacts, as well as potential water demand and wastewater treatment impacts. These potential impacts will be evaluated in the Draft EIR.

As discussed in the previous checklist discussions, the proposed expedited BARCT requirements are not expected to exceed any of the applicable significance thresholds, which also serve as the cumulative significance thresholds, for the environmental resources of aesthetics, agricultural and forestry resources, biological resources, cultural resources, geology and soils, greenhouse gases, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and tribal cultural resources. Therefore, the proposed project impacts on these environmental resources are not considered to be significant or cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and will not be evaluated in the Draft EIR.

Chapter 3

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APPENDIX A
AB 617 EXPEDITED BARCT IMPLEMENTATION SCHEDULE
COMMENT LETTERS RECEIVED ON THE NOP/IS

The following are comments received on the NOP/IS for the AB 617 Expedited BARCT Implementation Schedule Project. The NOP/IS was circulated for a 30-day public review and comment period starting August 7, 2018 and ending September 7, 2018. In addition, the BAAQMD conducted a CEQA scoping meeting at the Air District Headquarters' Yerba Room on August 24, 2018 to take public comment on the proposed project.

The BAAQMD received two comment letters on the NOP/IS during the public review period and did not receive public comments at the public scoping meeting. The two comment letters that were received during the public comment period are provided below.

David Joe

From: Osterberg, Todd Eugene <TOsterberg@chevron.com>
Sent: Thursday, August 23, 2018 3:09 PM
To: David Joe
Cc: Yang, Steven
Subject: Chevron Richmond BARCT comment 8-5

Good afternoon David,

I have a comment regarding AB617 BARCT implementation in relation to storage tanks (Reg. 8-5): Impacts to the appearance of the community skyline and other aesthetics imposed by the installation of BARCT, for example tank geodesic doming, should be considered in the rule making process.

Thank you.

Todd E Osterberg

CHMM

Environmental Specialist-Air
Chevron Richmond Refinery

Chevron Products Company

Global Downstream
Tel 510 242 2813
Cell 925 951 7109

NATIVE AMERICAN HERITAGE COMMISSION

Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710



August 8, 2018

Victor Douglas
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Also sent via e-mail: vdouglas@baaqmd.gov

RE: SCH# 2018082003, Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule Project; Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties, California

Dear Mr. Douglas:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for Draft Environmental Impact Report for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit. 14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd. (a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a **separate category of cultural resources**, “tribal cultural resources” (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code § 21084.2). Please reference California Natural Resources Agency (2016) “Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form,” <http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf>. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends **lead agencies consult with all California Native American tribes** that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC’s recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
 - a. A brief description of the project.
 - b. The lead agency contact information.
 - c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
 - d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).
2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
 - a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).
3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
 - a. Alternatives to the project.
 - b. Recommended mitigation measures.
 - c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).
4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
 - a. Type of environmental review necessary.
 - b. Significance of the tribal cultural resources.
 - c. Significance of the project's impacts on tribal cultural resources.
 - d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).
5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).
6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
 - a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
 - b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
 - a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
 - b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
 - a. Avoidance and preservation of the resources in place, including, but not limited to:
 - i. Planning and construction to avoid the resources and protect the cultural and natural context.
 - ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
 - b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
 - i. Protecting the cultural character and integrity of the resource.
 - ii. Protecting the traditional use of the resource.
 - iii. Protecting the confidentiality of the resource.
 - c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
 - d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
 - e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
 - f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
 - a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
 - b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
 - c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

This process should be documented in the Cultural Resources section of your environmental document.

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires **local governments** to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. **Tribal Consultation**: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. **No Statutory Time Limit on SB 18 Tribal Consultation**. There is no statutory time limit on SB 18 tribal consultation.
3. **Confidentiality**: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. **Conclusion of SB 18 Tribal Consultation**: Consultation should be concluded at the point in which:
 - a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
 - b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: <http://nahc.ca.gov/resources/forms/>

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
 - a. If part or all of the APE has been previously surveyed for cultural resources.
 - b. If any known cultural resources have been already been recorded on or adjacent to the APE.
 - c. If the probability is low, moderate, or high that cultural resources are located in the APE.
 - d. If a survey is required to determine whether previously unrecorded cultural resources are present.
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
 - a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.

- b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.
- 3.** Contact the NAHC for:
 - a.** A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
 - b.** A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.
- 4.** Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
 - a.** Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
 - b.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
 - c.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

Please contact me if you need any additional information at gayle.totton@nahc.ca.gov.

Sincerely,



Gayle Totton, M.A., Ph.D.
Associate Governmental Program Analyst
(916) 373-3714

cc: State Clearinghouse

APPENDIX B

EMISSION CALCULATIONS

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Appendix B
Expedited BARCT Implementation Schedule
Construction Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Daily Concurrent Construction Emissions (lb/day)						
5 VRU, Incinerators, or Vapor Combustors	0.2	1.8	2.3	0.1	0.8	0.4
5 Domes	12.2	123.9	116.9	0.4	13.0	7.8
1 Lime Injector	<0.1	0.4	0.5	<0.01	0.2	0.1
1 Large SCR	7.1	20.6	23.5	0.7	4.6	4.0
3 Refinery WGS or LoTox Scrubber	51	201	252	0.3	117	69
Total Concurrent Emissions (lbs/day)	70.5	347.7	395.2	1.5	135.6	81.3
Significance Thresholds	54	None	54	None	82	54
Significant?	Yes	--	Yes	--	Yes	Yes

Appendix B
Expedited BARCT Implementation Schedule
Operational Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Daily Concurrent Operational Emissions (lb/day)							
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6	18.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	1.2
Delivery Trucks for Caustic, Ammonia, and Lime	2.7	0.4	12.5	0.1	0.3	0.1	0.7
Total Concurrent Emissions	5.1	107.4	25.6	0.3	2.9	2.7	20.6
Reductions from Project Implementation ⁽¹⁾	411.0	--	--	6932	--	--	--
Net Concurrent Emissions ⁽²⁾	-405.9	107.4	25.6	-6931.8	2.9	2.7	20.6
Significance Thresholds	54	None	54	None	82	54	None
Significant?	No	--	No	--	No	No	--
Annual Concurrent Operational Emissions (tons/yr)							
15 Oxidizers	0.4	19.5	2.4	0.1	0.5	0.5	6825.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	451.9
Delivery Trucks for Caustic, Ammonia, and Lime	0.1	0.1	0.5	0.1	0.1	0.1	111.2
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5	7388.8
Reductions from Project Implementation	75.0	0.0	0.0	1265.0	0.0	0.0	0.0
Net Concurrent Emissions ⁽²⁾	-74.5	19.5	2.9	-1264.9	0.6	0.5	7388.8
Significance Thresholds	10	None	10	None	15	10	10000
Significant?	No	--	No	--	No	No	No

Note:

(1) Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

Appendix B
Expedited BARCT Implementation Schedule
Typical Construction Equipment

Equipment Type	ROG (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM10 (lb/hr)	CO2e (lb/hr)
Aerial Lift	0.00	0.17	0.10	0.00	0.00	0.01
Backhoe	0.02	0.36	0.27	0.00	0.02	0.02
Compressor	0.02	0.21	0.13	0.00	0.01	0.01
Concrete Saw	0.03	0.25	0.18	0.00	0.02	0.01
Crane	0.05	0.40	0.72	0.00	0.03	0.04
Drill Rig Large	0.08	0.50	1.06	0.00	0.04	0.07
Excavator	0.02	0.51	0.31	0.00	0.01	0.03
Forklift	0.02	0.22	0.17	0.00	0.01	0.01
Front End Loader	0.05	0.44	0.60	0.00	0.03	0.04
Generator	0.02	0.22	0.13	0.00	0.01	0.01
Light Plants	0.02	0.29	0.13	0.00	0.01	0.01
Welding Machine	0.03	0.23	0.18	0.00	0.02	0.01

Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006

Equipment Type	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	CO2e (lb/day)
Aerial Lift	0.037995	1.372031	0.783044	0.003538	0.015551	0.085244
Backhoe	0.182131	2.904058	2.191215	0.006362	0.130734	0.153284
Compressor	0.182209	1.662714	1.016855	0.002355	0.079061	0.05674
Concrete Saw	0.265078	1.975434	1.448896	0.003111	0.121785	0.074946
Crane	0.420426	3.185271	5.794775	0.011741	0.266954	0.282861
Drill Rig Large	0.639636	4.007488	8.517353	0.022198	0.335185	0.534803
Excavator	0.19881	4.111668	2.482458	0.010666	0.103511	0.256955
Forklift	0.133628	1.732806	1.389462	0.003185	0.099319	0.076729
Front End Loader	0.378682	3.548417	4.802831	0.01285	0.21504	0.309592
Generator	0.182209	1.764821	1.016855	0.002355	0.079061	0.05674
Light Plants	0.182209	2.312164	1.016855	0.002355	0.079061	0.05674
Welding Machine	0.265078	1.817133	1.448896	0.003111	0.121785	0.074946

Assumes 8 hour days.

Appendix B
Expedited BARCT Implementation Schedule
Dome Off-road Construction Emissions

Phase	Equipment	HP	Amount	Days	Hr/Day	Total Hours	Emission Factors (lb/hr)						Emissions (lb)							
							VOC	CO	NOx	SOx	PM10	CO2e	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)	
Equipment Installation	Air Compressor	Comp	1	20	8	160	0.02	0.13	0.21	0.00	0.01	0.01	3.64	33.25	20.34	0.05	1.58	1.57	1.13	
Equipment Installation	Crane	Comp	1	20	4	80	0.05	0.40	0.72	0.00	0.03	0.04	4.20	31.85	57.95	0.12	2.67	2.64	2.83	
Equipment Installation	Forklift	Comp	1	20	8	160	0.02	0.22	0.17	0.00	0.01	0.01	2.67	34.66	27.79	0.06	1.99	1.97	1.53	
Equipment Installation	Generator Sets	50	2	20	8	320	0.02	0.28	0.13	0.00	0.01	0.01	7.29	89.97	40.67	0.09	3.16	3.13	2.27	
Equipment Installation	Aerial Lift	Comp	4	20	8	640	0.00	0.17	0.10	0.00	0.00	0.01	3.04	109.76	62.64	0.28	1.24	1.23	6.82	
Equipment Installation	Welder	50	4	20	8	640	0.03	0.23	0.18	0.00	0.02	0.01	21.21	145.37	115.91	0.25	9.74	9.65	6.00	
Emissions for One Dome Construction (tons)							0.02	0.22	0.16	0.00	0.01	0.01	0.02	2.10	22.24	16.27	0.04	1.02	1.01	20.58
Peak Daily Emissions (lb/day)																				

Notes:

- (1) Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls
- (2) Carbon Dioxide Equivalents (CO2e) are based on fuel use and default emission factors for diesel. Metric tons.

**Appendix B
Expedited BARCT Implementation Schedule
Dome On-road Construction Emissions**

Phase	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (tonnes)	
Equipment Installation	Commuters	24.8	400	9920	0.000	0.002	0.000	0.000	0.000	0.000	0.906	0.426	17.070	2.743	0.070	3.251	1.431	4.078	
Equipment Installation	Delivery	40	10	400	0.000	0.002	0.007	0.000	0.000	0.000	2.247	0.169	0.758	2.662	0.010	0.379	0.224	0.408	
Equipment Installation	HHDT	40	10	400	0.000	0.002	0.011	0.000	0.000	0.002	3.745	0.141	0.923	4.311	0.014	1.032	0.264	0.680	
Emissions for One Dome Construction (Total Emissions)																			
												0.000	0.009	0.005	0.000	0.002	0.001	0.001	5.165
												0.331	2.535	7.110	0.028	1.574	0.560	1.291	

Notes:

- (1) Peak day assumes 20 workers per day and all deliveries occur in one day. Project emissions based on 20 commuters per day for 20 days.
- (2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.
- (3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011
 $E = k(sL)^{0.91} \times (W)^{0.82}$
 Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m²) (0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)
 (4) Carbon Dioxide Equivalence (CO₂e) = CO₂ + CH₄ * 21 + N₂O * 310
 where CO₂ emissions factors are from Emfac2011. CH₄ and N₂O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.
 where light vehicle are gasoline light duty trucks.
 where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019		
	Light	Medium	Heavy
CO ₂ (lb/mi)	0.8949	2.2430	3.7418
CH ₄ (g/mi)	0.0148	0.0051	0.0051
N ₂ O (g/mi)	0.0157	0.0048	0.0048
CO ₂ e (lb/mi)	0.906	2.247	3.745

Appendix B
Expedited BARCT Implementation Schedule
Dome Construction Emission Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction of One Dome	2.43	24.78	23.37	0.07	2.59	1.57	2.32
Construction of Five Concurrent Domes	12.17	123.89	116.87	0.35	12.97	7.85	11.60
Total Emissions (tons)							
Construction of One Dome	0.02	0.23	0.17	0.00	0.01	0.01	25.75
Construction of Five Dome	0.11	1.16	0.84	0.00	0.06	0.06	128.74
Construction of 20 Domes	0.43	4.64	3.35	0.01	0.25	0.22	514.96

Appendix B
Expedited BARCT Implementation Schedule
ESP Off-road Construction Emissions

Phase	Equipment	Offroad Category	HP	Amount	Days	Hr/Day	Total Hours	Emission Factors (lb/hr)				Emissions (lb)													
								CO	NOx	SOx	PM10	CO2e	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)							
Site Prep and Foundation	Aerial Lift	Aerial Lift	Comp	0	120	0	0	0.00	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Site Prep and Foundation	Backhoe	Tractors/Loaders/Backhoes	Comp	1	120	20	2400	0.02	0.36	0.27	0.00	0.02	54.64	871.22	657.36	1.91	39.22	38.83	45.99						
Site Prep and Foundation	Compressor	Other Industrial Equipment	50	1	120	20	2400	0.02	0.21	0.13	0.00	0.01	54.66	498.81	305.06	0.71	23.72	23.48	17.02						
Site Prep and Foundation	Concrete Saw	Other Construction Equipment	50	1	120	4	480	0.03	0.25	0.18	0.00	0.02	39.76	296.32	217.33	0.47	18.27	18.09	11.24						
Site Prep and Foundation	Crane	Crane	Comp	1	120	4	480	0.05	0.40	0.72	0.00	0.03	25.23	191.12	347.89	0.70	16.02	15.86	16.97						
Site Prep and Foundation	Drill Rig Large	Drill Rig (Mobile)	Comp	1	120	10	1200	0.08	1.06	1.06	0.00	0.04	95.95	601.12	1277.60	3.33	50.28	49.78	80.22						
Site Prep and Foundation	Excavator	Excavator	Comp	1	120	20	2400	0.02	0.51	0.31	0.00	0.03	59.64	1233.50	744.74	3.20	31.05	30.74	77.09						
Site Prep and Foundation	Forklift	Forklift	Comp	1	120	20	2400	0.02	0.22	0.17	0.00	0.01	40.09	519.84	416.84	0.96	29.80	29.50	23.02						
Site Prep and Foundation	Front End Loader	Rubber Tired Loaders	Comp	1	120	20	2400	0.05	0.44	0.60	0.00	0.03	113.60	1064.52	1440.85	3.86	64.51	63.87	92.88						
Site Prep and Foundation	Generator	Other Industrial Equipment	50	2	120	20	4800	0.02	0.22	0.13	0.00	0.01	109.33	1058.89	610.11	1.41	47.44	46.96	34.04						
Site Prep and Foundation	Light Plants	Other Industrial Equipment	50	2	120	20	4800	0.02	0.29	0.13	0.00	0.01	54.66	693.65	305.06	0.71	23.72	23.48	17.02						
Site Prep and Foundation	Welding Machine	Other Construction Equipment	50	0	120	0	0	0.03	0.23	0.18	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Equipment Installation	Aerial Lift	Aerial Lift	Comp	0	140	0	0	0.00	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Equipment Installation	Backhoe	Tractors/Loaders/Backhoes	Comp	0	140	0	0	0.02	0.36	0.27	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Equipment Installation	Compressor	Other Industrial Equipment	50	0	140	0	0	0.02	0.21	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Equipment Installation	Concrete Saw	Other Construction Equipment	50	3	140	4	1680	0.03	0.25	0.18	0.00	0.02	0.01	55.67	414.84	304.27	0.65	25.57	25.32	15.74					
Equipment Installation	Crane	Crane	Comp	0	140	0	0	0.05	0.40	0.72	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Equipment Installation	Drill Rig Large	Drill Rig (Mobile)	Comp	0	140	0	0	0.08	1.06	1.06	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Equipment Installation	Excavator	Excavator	Comp	2	140	20	5600	0.02	0.51	0.31	0.00	0.01	139.17	2878.17	1737.22	7.47	72.46	71.73	179.87						
Equipment Installation	Forklift	Forklift	Comp	0	140	0	0	0.02	0.22	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Equipment Installation	Front End Loader	Rubber Tired Loaders	Comp	2	140	20	5600	0.05	0.44	0.60	0.00	0.03	0.04	285.08	2483.89	3361.98	9.00	150.53	149.02	216.71					
Equipment Installation	Generator	Other Industrial Equipment	50	4	140	10	5600	0.02	0.22	0.13	0.00	0.01	127.55	1235.37	711.80	1.65	55.34	54.79	39.72						
Equipment Installation	Light Plants	Other Industrial Equipment	50	1	140	20	2800	0.02	0.29	0.13	0.00	0.01	63.77	809.26	355.90	0.82	27.67	27.39	19.86						
Equipment Installation	Welding Machine	Other Construction Equipment	50	5	140	20	14000	0.03	0.23	0.18	0.00	0.02	0.01	463.89	3179.98	2535.57	5.44	213.12	210.99	131.16					
QA/QC	Aerial Lift	Aerial Lift	Comp	0	20	0	0	0.00	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Backhoe	Tractors/Loaders/Backhoes	Comp	0	20	0	0	0.02	0.36	0.27	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Compressor	Other Industrial Equipment	50	0	20	0	0	0.02	0.21	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Concrete Saw	Other Construction Equipment	50	1	20	4	80	0.03	0.25	0.18	0.00	0.02	0.01	2.65	19.75	14.49	0.03	1.22	1.21	0.75					
QA/QC	Crane	Crane	Comp	0	20	0	0	0.05	0.40	0.72	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Drill Rig Large	Drill Rig (Mobile)	Comp	0	20	0	0	0.08	1.06	1.06	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Excavator	Excavator	Comp	2	20	10	400	0.02	0.51	0.31	0.00	0.01	0.03	9.94	205.58	124.12	0.53	5.18	5.12	12.85					
QA/QC	Forklift	Forklift	Comp	0	20	0	0	0.02	0.22	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Front End Loader	Rubber Tired Loaders	Comp	0	20	0	0	0.05	0.44	0.60	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
QA/QC	Generator	Other Industrial Equipment	50	2	20	10	400	0.02	0.22	0.13	0.00	0.01	9.11	86.24	50.84	0.12	3.95	3.91	2.84						
QA/QC	Light Plants	Other Industrial Equipment	50	1	20	10	200	0.02	0.29	0.13	0.00	0.01	4.56	57.80	25.42	0.06	1.98	1.96	1.42						
QA/QC	Welding Machine	Other Construction Equipment	50	1	20	20	400	0.03	0.23	0.18	0.00	0.02	0.01	13.25	90.86	72.44	0.16	6.09	6.03	3.75					
Tie-in	Aerial Lift	Aerial Lift	Comp	0	10	0	0	0.00	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Backhoe	Tractors/Loaders/Backhoes	Comp	1	10	24	240	0.02	0.36	0.27	0.00	0.02	0.02	5.46	87.12	65.74	0.19	3.92	3.88	4.60					
Tie-in	Compressor	Other Industrial Equipment	50	0	10	0	0	0.02	0.21	0.13	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Concrete Saw	Other Construction Equipment	50	3	10	4	120	0.03	0.25	0.18	0.00	0.02	0.01	3.98	28.63	21.73	0.05	1.83	1.81	1.12					
Tie-in	Crane	Crane	Comp	0	10	0	0	0.05	0.40	0.72	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Drill Rig Large	Drill Rig (Mobile)	Comp	0	10	0	0	0.08	1.06	1.06	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Excavator	Excavator	Comp	2	10	24	480	0.02	0.51	0.31	0.00	0.01	0.03	11.93	246.70	148.95	0.64	6.21	6.15	15.42					
Tie-in	Forklift	Forklift	Comp	0	10	0	0	0.02	0.22	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Front End Loader	Rubber Tired Loaders	Comp	0	10	0	0	0.05	0.44	0.60	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Generator	Other Industrial Equipment	50	4	10	12	480	0.02	0.22	0.13	0.00	0.01	10.93	105.89	61.01	0.14	4.74	4.70	3.40						
Tie-in	Light Plants	Other Industrial Equipment	50	0	10	0	0	0.02	0.29	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Welding Machine	Other Construction Equipment	50	0	10	0	0	0.02	0.23	0.18	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Tie-in	Welding Machine	Other Construction Equipment	50	2	10	24	480	0.03	0.23	0.18	0.00	0.02	0.01	15.90	109.03	86.93	0.19	7.31	7.23	4.50					
Total Emissions for Construction of Two ESPs (tons)																									
Site Prep and Foundation (Peak Daily Emissions lb/day)																									
Equipment Installation (Peak Daily Emissions lb/day)																									
QA/QC (Peak Daily Emissions lb/day)																									
Tie-in (Peak Daily Emissions lb/day)																									
Total Emissions for Construction of Two ESPs (tons)																									
Site Prep and Foundation (Peak Daily Emissions lb/day)																									
Equipment Installation (Peak Daily Emissions lb/day)																									
QA/QC (Peak Daily Emissions lb/day)																									
Tie-in (Peak Daily Emissions lb/day)																									

Notes:
 (1) Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006 : http://www.sqmd.gov/ceqa/handbook/offroad/EF07_25.xls
 (2) Carbon Dioxide Equivalents (CO2e) are based on fuel use and default emission factors for diesel. Metric tons.
 (3) Equipment list and schedule from FEIR for Exxon Mobil Rule 1105.1 Compliance Project (SCAQMD 2007). Equipment installation phase duration scaled by half for one ESP instead of two.

Appendix B
Expedited BARCT Implementation Schedule
ESP Construction Emission Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Site Prep and Foundation	5.64	63.56	57.66	0.17	4.67	3.44	5.10
Equipment Installation	8.09	83.60	65.17	0.20	4.85	4.27	5.49
QA/QC	2.02	24.43	14.75	0.05	1.20	1.03	1.41
Tie-in	4.90	60.48	39.20	0.13	2.96	2.62	3.56
Total Emissions (tons)							
Construction Activities for One ESP ⁽¹⁾	0.96	10.56	8.42	0.03	0.71	0.56	1075.77

(1) Assumes 14 months of construction.

**Appendix B
Expedited BART Implementation Schedule
ESP On-road Construction Emissions**

Phase	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (tonnes)
Site Prep and Foundation	Commuters	24.8	11400	282720	0.000	0.002	0.000	0.000	0.000	0.000	0.895	12.14	486.48	78.18	2.00	92.64	40.78	114.76
Site Prep and Foundation	Delivery	40	5	200	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.08	0.38	1.33	0.01	0.19	0.11	0.20
Site Prep and Foundation	HHDT	40	1200	48000	0.000	0.002	0.011	0.000	0.000	0.000	3.742	16.91	110.79	517.29	1.68	123.90	31.69	81.47
Equipment Installation	Commuters	24.8	32900	815920	0.000	0.002	0.000	0.000	0.000	0.000	0.895	35.03	1403.97	225.62	5.78	267.36	117.68	331.20
Equipment Installation	Delivery	40	15	600	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.25	1.14	3.99	0.02	0.57	0.34	0.61
Equipment Installation	HHDT	40	5	200	0.000	0.002	0.011	0.000	0.000	0.002	3.742	0.07	0.46	2.16	0.01	0.52	0.13	0.34
QA/QC	Commuters	24.8	600	14880	0.000	0.002	0.000	0.000	0.000	0.000	0.895	0.64	25.60	4.11	0.11	4.88	2.15	6.04
QA/QC	Delivery	40	5	200	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.08	0.38	1.33	0.01	0.19	0.11	0.20
QA/QC	HHDT	40	5	200	0.000	0.002	0.011	0.000	0.000	0.002	3.742	0.07	0.46	2.16	0.01	0.52	0.13	0.34
Tie-in	Commuters	24.8	600	14880	0.000	0.002	0.000	0.000	0.000	0.000	0.895	0.64	25.60	4.11	0.11	4.88	2.15	6.04
Tie-in	Delivery	40	5	200	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.08	0.38	1.33	0.01	0.19	0.11	0.20
Tie-in	HHDT	40	5	200	0.000	0.002	0.011	0.000	0.000	0.002	3.742	0.07	0.46	2.16	0.01	0.52	0.13	0.34
Total Emissions (tons)																		
Site Prep and Foundation (Peak Daily Emissions lb/day)																		
Equipment Installation (Peak Daily Emissions lb/day)																		
QA/QC (Peak Daily Emissions lb/day)																		
Tie-in (Peak Daily Emissions lb/day)																		

Notes:

- Peak day assumes 20 workers per day and all deliveries occur in one day. Project emissions based on 20 commuters per day for 20 days.
- Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.
- Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$$E = k(SL)^{0.91} \times (W)^{1.02}$$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m²)
 (0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light, 5.5 for medium trucks, and 24 for heavy trucks)
- Carbon Dioxide Equivalents (CO₂e) = CO₂ + CH₄ * 21 + N₂O * 310
 where CO₂ emissions factors are from Emfac2011. CH₄ and N₂O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.
 where light vehicle are gasoline light duty trucks.
 where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019	
	Light	Heavy
CO ₂ (lb/mi)	0.8949	3.7418
CH ₄ (g/mi)	0.0148	0.0051
N ₂ O (g/mi)	0.0157	0.0048
CO ₂ e (lb/mi)	0.906	3.745

(5) Equipment list and schedule from FEIR for Exxon Mobil Rule 1105.1 Compliance Project (SCAQMD 2007). Equipment installation phase duration scaled by half for one ESP instead of two.

Appendix B
Expedited BARCT Implementation Schedule
Oxidizer Construction Emission Summary

ACTIVITY⁽¹⁾	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction Activities for 1 Oxidizer	0.03	0.35	0.45	<0.01	0.15	0.07	0.57
Overlapping Construction Emissions for 5 Oxidizers	0.15	1.75	2.25	<0.01	0.75	0.35	2.87
Total Emissions (tons)							
Construction Activities for 1 Oxidizer ⁽²⁾	<0.001	0.004	0.005	<0.001	0.002	0.001	12.07
Construction Emissions for 15 Oxidizers	0.005	0.055	0.071	<0.01	0.024	0.011	180.98

Notes:

(1) Emissions from Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015)

(2) Assumes 21 days of construction.

Appendix B
Expedited BARCT Implementation Schedule
Lime Injector Construction Emission Summary

ACTIVITY⁽¹⁾	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction Activities for Lime Injector	0.03	0.35	0.45	<0.01	0.15	0.07	0.57
Total Emissions (tons)							
Construction Activities for Lime Injector ⁽²⁾	<0.001	0.004	0.005	<0.001	0.002	0.001	12.07

Notes:

(1) Emissions from Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015). Assumes similar emissions to oxidizer construction.

(2) Assumes 21 days of construction.

Appendix B
Expedited BARCT Implementation Schedule
WGS Construction Emission Summary

ACTIVITY⁽¹⁾	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Demolition	6.00	36.00	28.00	<1	3.00	2.00	--
Construction	17.00	67.00	84.00	<1	39.00	23.00	--
Total Emissions (tons)							
Demolition ⁽²⁾	0.06	0.36	0.28	<0.1	0.03	0.02	--
Construction ⁽³⁾	2.04	8.04	10.08	<0.1	4.68	2.76	--
Total Construction Emissions	2.10	8.40	10.36	<0.1	4.71	2.78	468.00

Notes:

(1) Emissions from FEIR for ConocoPhillips Los Angeles Refinery PM10 and Nox Reduction Projects (SCAQMD 2007)

(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)

(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

Appendix B
Expedited BARCT Implementation Schedule
LoTox Scrubber Construction Emission Summary

ACTIVITY⁽¹⁾	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Demolition	6.00	36.00	28.00	<1	3.00	2.00	--
Construction	17.00	67.00	84.00	<1	39.00	23.00	--
Total Emissions (tons)							
Demolition ⁽²⁾	0.06	0.36	0.28	<0.1	0.03	0.02	--
Construction ⁽³⁾	2.04	8.04	10.08	<0.1	4.68	2.76	--
Total Construction Emissions	2.10	8.40	10.36	<0.1	4.71	2.78	468.00

Notes:

(1) Emissions from FEIR for ConocoPhillips Los Angeles Refinery PM10 and Nox Reduction Projects (SCAQMD 2007)

(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)

(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

Appendix B
Expedited BARCT Implementation Schedule
SCR Construction Emissions Summary

ACTIVITY⁽¹⁾	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Off-road Construction Emissions	1.86	12.02	14.94	0.00	4.12	3.79	--
On-road Vehicle Trip Emissions	5.22	8.58	8.6	0.71	0.47	0.22	--
Total Construction Emissions	7.08	20.6	23.54	0.71	4.59	4.01	--
Annual Emissions (tons/yr)							
Construction for One SCR ⁽²⁾	0.69	3.18	3.75	0.07	0.85	0.76	574

Notes:

(1) Emissions from Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015)

(2) Assumes 12 months of construction.

Appendix B
Expedited BART Implementation Schedule
Operation Emissions from Thermal Oxidizer

Parameter ⁽¹⁾	VOC	CO ⁽²⁾	NOx ⁽³⁾	SOx	PM10	PM2.5	CO ₂	N ₂ O	CH ₄	CO ₂ e
Emission Factor ⁽⁴⁾	7.00	0.30	0.04	0.60	7.50	7.50	120000.00	0.64	2.30	120246.70
Emission Factor Units	lb/mmscf	lb/mmbtu	lb/mmbtu	lb/mmmbtu	lb/mmmscf	lb/mmmscf	lb/mmmscf	lb/mmmscf	lb/mmmscf	lb/mmmscf
Heater Duty mmbtu/hr	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Heating Value (btu/scf)	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00
Fuel Use (mmscf/yr)	25	25	25	25	25	25	25	25	25	25
Operational Time (hr/day)	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Daily Emissions (lb)	0.16	7.10	0.88	0.01	0.17	0.17	2742.86	0.01	0.05	2748.50
Daily Total for 15 Oxidizers (lb)	2.40	106.56	13.13	0.21	2.57	2.57	41142.86	0.22	0.79	41227.44
Annual Emissions (tons or MT for GHG Emissions)	0.03	1.30	0.16	0.00	0.03	0.03	454.12	0.00	0.01	455.05
Annual Emissions for 15 Oxidizers (tons or MT for GHG Emissions)	0.44	19.45	2.40	0.04	0.47	0.47	6811.73	0.04	0.13	6825.74

Note:

(1) Detailed calculations can be found in BAAQMD, 2016, Appendix A.

(2) Based on 400 ppm

(3) Based on 30 ppm

(4) Default emission factors for natural gas combustion for external combustion sources. SCAQMD Annual Emissions Reporting and AP-42 for GHG emissions.

**Appendix B
Expedited BART Implementation Schedule
Operational Delivery Truck Emissions**

Equipment	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Cautic/Catalyst for 1 WGS	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Cautic/Catalyst for 1 LoTox Scrubber	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Lime for Cement Kiln	HHDT	100	365	36500	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	12.860	84.246	393.357	1.279	94.212	24.101	62.008
Annual Emissions (tons/yr)												0.05	0.08	0.48	0.05	0.13	0.05	146.82
Peak Daily (lb/day)												0.39	2.66	12.52	0.05	0.29	0.09	0.58

Notes:

- Peak day assumes 3 caustic delivery trucks for WGS, 1 caustic delivery truck for LoTox, and 1 lime delivery truck.
- Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.
- Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011
 $E = k(sL)^{0.91} \times (W)^{1.02}$
 Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)
 (0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)
- Carbon Dioxide Equivalence (CO₂e) = CO₂ + CH₄ * 21 + N₂O*310
 where CO₂ emissions factors are from Emfac2011, CH₄ and N₂O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008, where light vehicle are gasoline light duty trucks, where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019		
	Light	Medium	Heavy
CO ₂ (lb/mi)	0.8949	2.2430	3.7418
CH ₄ (g/mi)	0.0148	0.0051	0.0051
N ₂ O (g/mi)	0.0157	0.0048	0.0048
CO ₂ e (lb/mi)	0.906	2.247	3.745

Daily Peak Emissions (lbs/day)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Cautic/Catalyst for 1 WGS	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Cautic/Catalyst for 1 LoTox Scrubber	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Lime for Cement Kiln	0.07	0.46	2.16	0.01	0.05	0.01	749.05

Annual Emissions (tons/yr)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Cautic/Catalyst for 1 WGS	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Cautic/Catalyst for 1 LoTox Scrubber	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Lime for Cement Kiln	0.01	0.04	0.20	0.00	0.05	0.01	0.03

Appendix B
Expedited BARCT Implementation Schedule
GHG Emissions from Electricity

Control Equipment	Number of Units	Potential Increased Electricity Demand (MWhr/yr)	Emission Factor (lb/MWhr) ⁽¹⁾	Emissions (CO₂e MT/yr)
WGS ⁽²⁾	1	261	644	76.24
LoTox Scrubber ⁽²⁾	1	261	644	76.24
SCR ⁽³⁾	1	222	644	64.82
ESP ⁽⁴⁾	2	803	644	234.57
Total Emissions				451.87

(1) CAPCOA, 2016. Based on PG&E emission factors from CalEEMod.

(2) FEIR for ConocoPhillips Los Angeles Refinery PM10 and Nox Reduction Projects (SCAQMD 2007)

(3) Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015)

(4) FEIR for Exxon Mobil Rule 1105.1 Compliance Project (SCAQMD 2007)

Appendix B
Expedited BARCT Implementation Schedule
Scrubber TAC Emissions

Pollutant	Daily Usage (tons/day)	Annual Usage (tons/day)	Usage Rate (gal/day)	Density (lb/gal)	Daily Usage (lb/day)
NaOH (50% solution)	3.37	1228.30	22.00	12.747	280.43

NaOH Demand Filling Loss (lb/day)	Q = Fill Rate = NaOH Demand (MMgal/day)	S = Saturation Factor	P = Vapor Pressure of material Loaded (psia)	M = NaOH vapor molecular weight (lb/lbmole)	T = temperature of liquid loaded (oR)	Daily PM10 Filling Loss (lb/day)	Eworking = Hourly PM10 Working Loss (lb/hr)	Total Hourly PM10 Loss (lb/hr)	Total Hourly PM10 Loss (lb/hr) at 25m
3.37	0.53	1.45	0.042	24.8	544.67	1.82E-02	7.60E-04	2.28E-03	2.28E-05

NaOH @ 50% solution density = 12.747 lb/gal

Mv for NaOH solution = 24.8 lb/lbmol

Vapor Pressure for NaOH = 2.18 mmHg at 29.4oC or 85oF = 0.042 psia

Loading Temperature = 85°F to 100°F (544.67°R to 559.67°R)

Breathing Loss = 3 * Filling Loss

Filling Loss

$E_{\text{loading}} \text{ lb/day} = (12.46) ((S)(P)(M)(Q))/T$ where:

S = saturation factor (dimensionless; obtained from Table 5.2-1 in AP-42)

= 1.45 (Splash loading; dedicated normal service)

P = vapor pressure of the material loaded at temperature T (psia)

M = vapor molecular weight (lb/lb-mole)

Q = volume of material loaded (1,000 gal/day)

T = temperature of liquid loaded (°R).

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

RESOLUTION NO. 2018-

**A Resolution of the Board of Directors of the
Bay Area Air Quality Management District
Adopting Expedited BARCT Implementation Schedule;
and
Certifying a CEQA Environmental Impact Report for the Project**

RECITALS

WHEREAS, Health & Safety Code section 40920.6 requires each air district that is a nonattainment area for one or more air pollutants to adopt, on or before January 1, 2019, an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date, but no later than December 31, 2023;

WHEREAS, the San Francisco Bay Area Air Basin is designated by the California Air Resources Board as a nonattainment area for the state ambient eight-hour ozone standard of 0.070 ppm; the state ambient one-hour ozone standard of 0.09 ppm; the state ambient annual arithmetic mean particulate matter standard of 20 $\mu\text{g}/\text{m}^3$ for PM₁₀; the state 24-hour particulate matter standard of 50 $\mu\text{g}/\text{m}^3$ for PM₁₀; and the state ambient annual arithmetic mean particulate matter standard of 12 $\mu\text{g}/\text{m}^3$ for PM_{2.5};

WHEREAS, the Bay Area Air Quality Management District ("District") is therefore required by Health and Safety Code section 40920.6 to adopt an expedited schedule for implementation of BARCT;

WHEREAS, District staff have prepared the Expedited BARCT Implementation Schedule, as set forth in Attachment A hereto and incorporated herein by reference (the "BARCT Schedule"), in order to implement the provisions of Health & Safety Code section 40920.6;

WHEREAS, District staff developed a concept paper describing the BARCT determination process and potential rule development projects included in the Expedited BARCT implementation schedule and published the concept paper and rule development scope papers on the Air District website on May 24, 2018 and accepted written comments on the documents through June 15, 2018;

WHEREAS, on May 21, 2018 and July 30, 2018, District staff discussed the draft rule with the Stationary Source Committee of the Board of Directors;

WHEREAS, District staff also discussed the BARCT Schedule with representatives from community and environmental groups, as well as representatives from affected facilities and industries;

WHEREAS, based on comments received on the concept paper and rule development scope papers, and in discussions with community, environmental, and industry groups and representatives, District staff prepared an Initial Staff Report and revised rule development scope papers, which District staff published on the District website on September 5, 2018, and accepted comments on these documents through October 5, 2018;

WHEREAS, on September 5, 2018, District staff discussed the BARCT Schedule with the Board of Directors;

WHEREAS, District staff considered input received on the Initial Staff Report and revised rule development scope papers, and continued to conduct further analysis, coordinate with the California Air Resources Board and other air districts, and solicit public input, and based on the input so received and its own further analysis, District staff prepared the proposed BARCT Schedule and October 2018 Staff Report, which District staff published on the District website on October 23, 2018, and accepted comments on these documents through December 7, 2018;

WHEREAS, District staff have reviewed and considered all of the comments received and have revised the BARCT Schedule and associated documents accordingly, as reflected in the Final BARCT Schedule and final rule development scope papers, and have prepared written responses to the comments that have been provided to the Board of Directors for review;

WHEREAS, District staff has prepared and presented to the public and to the Board of Directors a detailed Final Staff Report describing the purpose of and need for the BARCT Schedule, the development of the BARCT Schedule, how the BARCT Schedule will comply with California Health and Safety Code section 40920.6, and how issues raised by members of the public are addressed by the BARCT Schedule, which Final Staff Report has been considered by this Board and is incorporated herein by reference;

WHEREAS, on October 23, 2018, Air District staff published in newspapers and distributed and published on the Air District's website a notice of a public hearing to be held on December 19, 2018 to consider adoption of the BARCT Schedule, and the notice included a request for public comments and input on the BARCT Schedule;

WHEREAS, the Board of Directors held a public hearing on December 19, 2018, to consider the BARCT Schedule, in accordance with all provisions of law, at which meeting District staff presented the BARCT Schedule and proposed it for adoption;

WHEREAS, at the public hearing, the subject matter of the BARCT Schedule was discussed with interested persons in accordance with all provisions of law;

WHEREAS, at the public hearing and prior to adopting the BARCT Schedule, the Board of Directors took into account the local public health and clean air benefits to the surrounding community; the cost-effectiveness of each control option; and the air quality and attainment benefits of each control option, as required by subdivision (d) of Health and Safety Code section 40920.6;

WHEREAS, the Board of Directors has determined that, as required by paragraph (2) of subdivision (c) of Health & Safety Code section 40920.6, the BARCT Schedule will apply to each industrial source within the District that, as of January 1, 2017, was subject to a market-based compliance mechanism adopted by the state board pursuant to subdivision (c) of Health and Safety Code section 38562 (the “Cap and Trade Program”);

WHEREAS, the Board of Directors has determined that, as required by paragraph (3) of subdivision (c) of Health & Safety Code section 40920.6, the BARCT Schedule will give highest priority to those permitted units that have not modified emissions-related permit conditions for the greatest period of time, and will not apply to any emissions unit that has implemented BARCT due to a permit revision or a new permit issuance since 2007;

WHEREAS, the BARCT Schedule complies with the applicable terms and conditions of Health & Safety Code section 40920.6 requiring certain air districts to adopt an expedited schedule for the implementation of best available retrofit control technology, including but not limited to the provisions referred to above;

WHEREAS, the proposed adoption of the BARCT Schedule constitutes a “project” pursuant to the California Environmental Quality Act (“CEQA”) (Public Resources Code §§ 21000 et seq.);

WHEREAS, the District is the lead agency for this project under CEQA Guidelines section 15050 (14 California Code of Regulations section 15050);

WHEREAS, District staff caused to be prepared an environmental impact report (“EIR”) analyzing the potential environmental impacts of the BARCT Schedule in accordance with the requirements of CEQA;

WHEREAS, the District prepared a Notice of Preparation and an Initial Study (NOP/IS) for the Draft Environmental Impact Report (DEIR) for the Expedited BARCT Implementation Schedule, which the District distributed in accordance with CEQA Guidelines section 15082 and published on the District’s website on August 7, 2018 for review and comment, and accepted written comments on the NOP/IS through September 7, 2018;

WHEREAS, the District noticed and conducted a scoping meeting in accordance with CEQA Guidelines section 15082, which meeting occurred on August 24, 2018;

WHEREAS, the District received two written comment letters regarding the NOP/IS during the 31-day public review and comment period;

WHEREAS, District staff considered all of the comments received and, taking due account of the comments and input received in the course of the scoping and consultation process, caused a Draft EIR to be prepared and publicized for review and comment by interested members of the public and others as required by CEQA;

WHEREAS, on or before October 23, 2018, the District published the Draft EIR and provided notification to the public and to other interested parties, via newspaper advertisement, email

notifications, and on the District's website (among other means), that the Draft EIR was complete and was available for public review and comment;

WHEREAS, the public notification materials published by the District (i) informed the public that the Draft EIR was available on the District website and by request to the District and (ii) invited public comments on the Draft EIR during the period from October 23, 2018 through December 7, 2018;

WHEREAS, the District received one written comment letter regarding the Draft EIR during the 45-day public review and comment period;

WHEREAS, District staff considered all of the comments received and has prepared a Final EIR, which incorporates certain revisions to the Draft EIR based on the comments received as well as other considerations, and which includes copies of the comments received as well as written responses to the comments prepared by District staff;

WHEREAS, the Final EIR, a copy of which is attached hereto and incorporated herein by reference, was presented to the Board of Directors and proposed for certification by the Board of Directors at a public meeting of the Board of Directors on December 19, 2018;

WHEREAS, none of the revisions to the Draft EIR include any significant new information that would require recirculation of the Draft EIR under CEQA Guidelines section 15088.5;

WHEREAS, the EIR found that the BARCT Schedule will have the potential to create a significant adverse impact on air quality that comes from construction emissions and cannot be mitigated to a level that is less than significant, as described in Chapter 3.2 of the Final EIR;

WHEREAS, the EIR found that the BARCT Schedule will have the potential to create a significant adverse impact on water demand that cannot be mitigated to a level that is less than significant, as described in Chapter 3.4 of the Final EIR;

WHEREAS, the EIR discussed potential mitigation measures for construction emission impacts as specified in Section 3.2.5 of Chapter 3.2 and water demand impacts in Section 3.4.5 of Chapter 3.4 which might reduce the significant air quality and water demand impacts identified in the EIR, as explained in Section 1.4 of Chapter 1 of the Final EIR, but those mitigation measures are within the responsibility and jurisdiction of public agencies other than the District, and such measures have been or could be adopted by such other agencies;

WHEREAS, substantial evidence in the record demonstrates that approval of the BARCT Schedule involves specific considerations related to the need identified by the Legislature to reduce air pollution and protect public health and the environment through the expeditious implementation of best available retrofit control technology at industrial sources subject to the Cap and Trade Program, and the District's obligation to do so under Health and Safety Code section 40920.6, that make the alternatives identified in the EIR that would avoid or substantially lessen the significant air quality and water demand impacts infeasible, as explained in Section 1.5 of Chapter 1 of the Final EIR;

WHEREAS, substantial evidence in the record demonstrates that the significant and unavoidable impacts to air quality during construction and from increases in water demand are acceptable as provided in CEQA Guidelines section 15093 because the public health and air quality benefits from the BARCT Schedule outweigh the Schedule's significant unavoidable impacts;

WHEREAS, this matter has been duly noticed and heard in compliance with applicable requirements of the Health and Safety Code and the Public Resources Code;

WHEREAS, the documents and other materials that constitute the record of proceedings on which the BARCT Schedule and the Final EIR are based are located at the Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, 94105, and the custodian for these documents is Marcy Hiratzka, Clerk of the Boards;

WHEREAS, District staff provided copies of (i) the BARCT Schedule, and (ii) the Final EIR, including the comments received on the Draft EIR and staff's responses thereto, to each of the members of the Board of Directors for their review and consideration in advance of the public meeting of the Board of Directors on December 19, 2018;

WHEREAS, District staff has recommended that the Board of Directors adopt the BARCT Schedule;

WHEREAS, the Board of Directors concurs with recommendations of District staff regarding the BARCT Schedule;

WHEREAS, District staff has recommended that the Board of Directors certify the Final EIR, which was prepared as the CEQA document for the BARCT Schedule, as being in compliance with all applicable requirements of CEQA;

WHEREAS, the Board of Directors concurs with recommendations of District staff regarding the Final EIR for the BARCT Schedule;

RESOLUTION

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors of the Bay Area Air Quality Management District does hereby certify and adopt the Final EIR pursuant to CEQA for the BARCT Schedule.

BE IT FURTHER RESOLVED that in support of and as part of its certification and adoption of the Final EIR for the BARCT Schedule, the Board of Directors hereby makes the following findings and certifications:

1. The Final EIR for the BARCT Schedule has been prepared in accordance with all requirements of CEQA.
2. The Final EIR for the BARCT Schedule was duly presented to the Board of Directors for its consideration in accordance with CEQA and other applicable legal requirements.

3. The Board of Directors has reviewed and considered the information in the Final EIR and the evidence in the record described and summarized in the Final EIR, including but not limited to (i) the Final EIR's conclusion that the BARCT Schedule will have significant air quality and water demand impacts as described in the Final EIR, (ii) the mitigation measures proposed to mitigate the significant air quality and water demand impacts outlined in the Final EIR, and (iii) the alternatives considered to avoid or substantially lessen the significant air quality and water demand impact that are evaluated in the Final EIR.
4. The Board of Directors specifically approves the mitigation measures outlined in the Final EIR, which are incorporated by reference as if fully set forth herein, to mitigate the BARCT Schedule's significant air quality and water demand impacts. No additional feasible mitigation measures have been identified that can further mitigate the significant impacts.
5. The Board of Directors finds that the mitigation measures for construction emission impacts discussed in Section 3.2.5 of Chapter 3.2 and water demand impacts in Section 3.4.5 of Chapter 3.4 of the Final EIR, as explained in Section 1.4 of Chapter 1 of the Final EIR, are within the responsibility and jurisdiction of public agencies other than the District, and such measures have been or could be adopted by such other agencies.
6. The analysis of alternatives set forth in Chapter 4 of the Final EIR has provided the Board of Directors with a basis for considering ways in which the significant air quality and water demand impacts could be avoided or substantially lessened while still achieving all or most of the Plan's objectives. The alternatives analysis in the Final EIR is sufficient to carry out the purposes of such analysis under CEQA.
7. The Board of Directors finds that there is a pressing need to reduce air pollution and to protect public health and the environment, and to comply with the mandate of the Legislature set forth in subdivisions (c) and (d) of Health and Safety Code section 40920.6, which the BARCT Schedule addresses. The Board of Directors finds that the benefits that will be obtained from the BARCT Schedule in addressing these needs constitute specific considerations that make the alternatives identified in the Final EIR to avoid or significantly lessen the BARCT Schedule's significant air quality and water demand impacts infeasible. In making this finding, the Board of Directors has considered and agrees with the reasons supporting the finding as set forth in Section 1.5 of Chapter 1 of the Final EIR, which are incorporated by reference as if fully set forth herein and which the Board of Directors adopts as its own.
8. The Final EIR (including responses to comments) is complete, adequate and in full compliance with CEQA as a basis for considering and acting upon the BARCT Schedule.
9. The Final EIR reflects the independent judgment and analysis of the Bay Area Air Quality Management District.
10. The Board of Directors has exercised its own independent judgment in reviewing, considering and certifying the Final EIR and in making the findings and certifications set

forth in this Resolution, which reflects the independent judgment and analysis of the Board of Directors.

BE IT FURTHER RESOLVED that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Expedited BARCT Implementation Schedule, a copy of which is attached hereto and incorporated herein by reference.

BE IT FURTHER RESOLVED that in support of and as part of its adoption of the BARCT Schedule, the Board of Directors hereby makes the following findings and certifications:

1. The BARCT Schedule provides for the implementation by the earliest feasible date, which in any event will be no later than December 31, 2023, of best available retrofit control technology at each industrial source within the District that, as of January 1, 2017, was subject to the Cap and Trade Program.
2. The BARCT Schedule will give highest priority to those permitted units that have not modified emissions-related permit conditions for the greatest period of time and will not apply to any emissions unit that has implemented BARCT due to a permit revision or a new permit issuance since 2007.
3. At the public hearing and prior to adopting the BARCT Schedule, the Board of Directors took into account the local public health and clean air benefits to the surrounding community; the cost-effectiveness of each control option; and the air quality and attainment benefits of each control option.
4. The Board of Directors' approval of the BARCT Schedule is based on and supported by (among other things) the Board's consideration of the Final EIR for the BARCT Schedule.
5. The Board of Directors has balanced the benefits of the BARCT Schedule against its unavoidable environmental risks in determining whether to approve the BARCT Schedule. The Board of Directors finds that the BARCT Schedule's benefits in reducing air pollution and protecting public health, and in fulfilling the specific mandate of the Legislature to adopt a BARCT Schedule as set forth in subdivisions (c) and (d) of Health and Safety Code section 40920.6, outweigh the adverse impacts from air quality impacts from construction emissions and increases in water demand from operation of air pollution control equipment that are expected to result from implementing the BARCT Schedule. The Board of Directors therefore finds that these significant impacts from the BARCT Schedule are acceptable pursuant to Section 15093 of the CEQA Guidelines, 14 Cal. Code Regs. § 15093; and makes this finding as a "Statement of Overriding Considerations" pursuant to Section 15093. The specific reasons supporting this finding and Statement of Overriding Considerations are as follows:
 - a. The Board of Directors has considered the air quality impacts associated with construction of air pollution control equipment to comply with the BARCT Schedule, which would be expected to be, in the worst-case, 70.5 pounds per day of reactive organic gases (in light of Bay Area emissions of approximately 273 tons per day), 347.7 pounds per day of carbon monoxide (in light of Bay Area emissions of approximately

1327 tons per day), 395.2 pounds per day of nitrogen oxides (in light of Bay Area emissions of approximately 316 tons per day), 1.5 pounds per day of sulfur oxides (in light of Bay Area emissions of approximately 21 tons per day), 135.6 pounds per day of PM10 (in light of Bay Area emissions of approximately 105 tons per day), and 81.3 pounds per day of PM2.5 (in light of Bay Area emissions of approximately 45 tons per day).

- b. The Board of Directors has considered the water demand increase of approximately 1.74 million gallons per day that is expected to result from the BARCT Schedule, which the Board of Directors has evaluated in light of the significant adverse impact the increase will have on the region's water supply resources as described in Chapter 3.4 of the Final EIR, and also in light of the Bay Area's total water usage of over one billion gallons per day, as well as the fact that the recent drought that has made water supply issues an especially acute concern over the past few years is now over.
- c. The Board of Directors has considered that, as explained in Section 1.4 of Chapter 1 and in Chapter 4 of the Final EIR, the air quality impacts associated with construction of air pollution control equipment and the water demand increase associated with the operation of air pollution control equipment are unavoidable consequences of the adoption of an expedited schedule for the implementation of best available retrofit control technology at sources subject to the Cap and Trade program in the District, and that the District's adoption of such a schedule is required under subdivisions (c) and (d) of Health and Safety Code section 40920.6, which were enacted as part of Assembly Bill 617, which was signed by the Governor in July 2017 and is intended ". . . to reduce emissions of toxic air contaminants and criteria pollutants in communities affected by a high cumulative exposure burden."
- d. In addition to the reasons outlined in subparagraphs a.-c. above, the Board of Directors has reviewed and considered the more detailed summary of reasons why the BARCT Schedule's benefits in reducing air pollution and protecting public health outweigh the BARCT Schedule's adverse air quality and water demand impacts set forth in Section 1.4 of Chapter 1 of the Final EIR for the BARCT Schedule. The Board of Directors agrees with the reasons set forth therein, and it adopts those reasons as its own and incorporates them by reference as if fully set forth herein as specific reasons supporting this finding and Statement of Overriding Considerations.

* * * * *

The foregoing resolution was duly and regularly introduced, passed and adopted at a regular meeting of the Board of Directors of the Bay Area Air Quality Management District on the Motion of Director _____, seconded by Director _____, on the ____ day of _____, 2018 by the following vote of the Board:

AYES:

NOES:

ABSENT:

David E. Hudson
Chairperson of the Board of Directors

ATTEST:

Rod Sinks
Secretary of the Board of Directors

DRAFT

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson David Hudson and Members
of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: December 5, 2018

Re: Public Hearing to Consider Adoption of Amendments to Three Regulations Affecting Refineries: (1) Amendments to Regulation 6, Rule 5: Particulate Matter from Refinery Fluid Catalytic Cracking Units; (2) Amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; (3) Amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking; and Certification of a Final Environmental Impact Report pursuant to the California Environmental Quality Act (CEQA)

RECOMMENDED ACTION

Staff recommends that the Board of Directors take the following actions:

- Adoption of proposed amendments to Regulation 6, Rule 5: Particulate Matter from Refinery Fluid Catalytic Cracking Units;
- Adoption of proposed amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers;
- Adoption of proposed amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking; and
- Certification of a Final Environmental Impact Report pursuant to the California Environmental Quality Act (CEQA).

DISCUSSION

The Bay Area Air Quality Management District (Air District) is proposing amendments to three Air District rules that affect the five Bay Area refineries. The proposed amendments to the three refinery rules will clarify or revise exemptions, definitions, and requirements for specific sections of all three rules.

- Proposed amendments to Rule 6-5 effect no substantive changes and are simply clarifications of original intent.

- Proposed amendments to Rule 11-10 reduce monitoring of cooling towers for hydrocarbon leaks from daily to weekly, with provisions to extend monitoring periods after demonstrating no leaks for an extended time. Costs for daily monitoring were found to be excessive relative to the potential hydrocarbon emission reductions. Requirements for cooling tower best management practices and reporting were eliminated when found to be focused primarily on Process Safety Management and cooling water chemistry rather than leak detection.
- Proposed amendments to Rule 12-15 establish thresholds for reporting requirements for non-crude oil feedstock imports and clarify processes for handling and securing confidential information.

CEQA DRAFT ENVIRONMENTAL IMPACT REPORT

Staff prepared a draft CEQA Initial Study and Environmental Impact Report (EIR) for adoption of the proposed amendments to the three refinery rules: Project Title: Amendments to Refinery Rules (Rules 6-5, 11-10, 12-15), State Clearing House Number: 2018082001. The draft EIR was conducted for all three proposed amended rules as individual projects under CEQA. The three proposed amended rules are being addressed in a single EIR for administrative convenience. Air quality impacts for one of the three projects are theoretically significant because the proposed amendments to Rule 11-10 involve changing rule language regarding monitoring requirements for refinery cooling towers. Because the proposed amendments mirror how the rule has been actually implemented rather than the rule language as adopted, there is no reduction in actual emissions from the proposed project. However, theoretical ROG emission reductions comparing the proposed amendments to the rule language as adopted as a result of the proposed project could exceed the significance threshold of 10 tons per year. Since the operational ROG emissions are an ozone precursor and ROG emissions could exceed the significance threshold, and the district is not in attainment for ozone, the theoretical impacts of the proposed amendments to Rule 11-10 could, theoretically, contribute to a future air quality violation.

The only feasible method to reduce ROG emissions from cooling towers is more frequent monitoring and repair. However, this method was concluded to not be feasible due to economic factors. Consistent with CEQA Guidelines §15364, no feasible mitigation measures have been identified that could avoid the significant impact or reduce the impact to less than significant.

RULE DEVELOPMENT PROCESS

Air District staff posted the CEQA Notice of Preparation / Initial Study of environmental impacts on August 1, 2018. Air District staff conducted a CEQA Scoping Meeting on Monday, August 20, 2018 at the District office. Comments for the CEQA analysis were due by Friday, September 7, 2018. The CEQA Initial Study and comments are found in the Draft Environmental Impact Report, Appendix A.

Air District staff posted the draft amendments to Rule 6-5, Rule 11-10, and Rule 12-15 and initial staff report on August 20, 2018 to solicit input and identify any potential issues and

concerns. Comments for the draft amendments and initial staff report were due by Friday, September 21, 2018. The Air District used the public's input, along with further investigation and analysis by staff to develop the final proposed amendments, and present to the Air District's Board of Directors for their consideration.

Staff also posted the proposed amendments Rule 6-5, Rule 11-10, and Rule 12-15 and staff report on October 22, 2018 in anticipation of a December 19, public hearing. Comments for the proposed amendments and staff report were due by Friday, December 7, 2018.

Pursuant to the California Environmental Quality Act (Public Resources Code § 21000 et seq.), the Air District Board of Directors will consider certification of the Environmental Impact Report that analyzes the proposed amendments to all three regulations pursuant to (Public Resources Code 15206, 15087(c) and § 21080(d) and CEQA Guidelines §15088 et seq.).

BUDGET CONSIDERATIONS/FINANCIAL IMPACTS

Provisions in these amendments to all three regulations will have minor impacts on Engineering, Meteorology and Measurements, and Compliance and Enforcement. In each case, the organization will fit small intermittent increases in work into existing workload priorities. No increase in personnel or costs is anticipated.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Guy Gimlen
Reviewed by: Victor Douglas

- Attachment 13A: Board Resolution—Amendments to Regulation 6, Rule 5: Particulate Matter from Refinery Fluid Catalytic Cracking Unit
- Attachment 13B: Board Resolution—Amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers;
- Attachment 13C: Board Resolution—Amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking
- Attachment 13D: Public Hearing Notice
- Attachment 13E: Proposed Amendments to Regulation 6, Rule 5: Particulate Matter from Refinery Fluid Catalytic Cracking Unit;
- Attachment 13F: Proposed Amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers;

- Attachment 13G: Proposed Amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking
- Attachment 13H: Final Staff Report – Refinery Rules Proposed Rule Amendments to: Rule 6-5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units Rule 11-10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers Rule 12-15: Petroleum Refining Emissions Tracking
- Attachment 13I: Socio-Economic Analysis: Proposed Amendments to Regulation 8, Rule 18 ("Equipment Leaks"), Regulation 11, Rule 10 ("Hexalent Chromium Emissions and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers"), and Draft New Regulation 6, Rule 5 ("Particulate Emissions from Refinery Fluidized Catalytic Cracking Units")
- Attachment 13J: Socio-Economic Analysis of Proposed Regulation 12, Rule 15: Petroleum Refining Emissions Tracking
- Attachment 13K: Final Environmental Impact Report pursuant to the California Environmental Quality Act (CEQA).

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

RESOLUTION NO. 2018-

**A Resolution of the Board of Directors of the
Bay Area Air Quality Management District
Amending District Regulation 6, Rule 5: Particulate Emissions from Refinery
Fluidized Catalytic Cracking Units; and Adopting a CEQA Environmental Impact
Report for the Project**

WHEREAS, public hearings have been properly noticed in accordance with the provisions of Health & Safety Code § 40725;

WHEREAS, the Board of Directors of the Bay Area Air Quality Management District (“Air District”) has determined that a need exists to amend District rules and regulations by adopting amendments to Regulation 6, Rule 5: Particulate Emissions from Fluidized Catalytic Cracking Units; as set forth in Attachment A hereto (“Proposed Amendments”);

WHEREAS, the Board of Directors of the Air District obtains its authority to adopt, amend or repeal rules and regulations from Sections 40000, 40001, 40702, and 40725 through 40728.5, of the California Health & Safety Code;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are written and displayed so that their meaning can be easily understood by the persons directly affected by the rule;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are in harmony with and not in conflict with or contradictory to existing statutes, court decisions, and state and federal regulations;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments do not impose the same requirements as any existing state or federal regulation, and are necessary and proper to execute the power and duties granted to, and imposed upon, the Air District;

WHEREAS, the Board of Directors of the Air District, by adopting the Proposed Amendments, is implementing, interpreting or making specific the provisions of Health & Safety Code § 40001 (rules to achieve ambient air quality standards), and § 40702 (rulemaking actions that are necessary and proper to execute the powers and duties granted to it);

WHEREAS, the Board of Directors of the Air District adopted Regulation 6, Rule 5 on December 16, 2015;

WHEREAS, in response to a lawsuit filed by the Western States Petroleum Association and three Bay Area refineries, the Air District entered into a settlement agreement with these parties dated March 24, 2017 in which the Air District committed to propose

revisions similar to the Proposed Revisions to the District Board of Directors for adoption;

WHEREAS, Air District staff has determined that Proposed Revisions are appropriate clarifications of the original intent of Regulation 6, Rule 5;

WHEREAS, the Air District prepared initial draft amendments, published them for comment on August 1, 2018;

WHEREAS, on July 25, 2018, Air District staff discussed the Proposed Amendments with the Ad Hoc Refinery Oversight Committee of the Board of Directors of the Air District;

WHEREAS, on October 24, 2018, the Air District transmitted the text of the Proposed Amendments to California Air Resources Board;

WHEREAS, on or before October 22, 2018, Air District staff published in newspapers and distributed and published on the District's website a notice of a public hearing to be held on December 19, 2018 to consider adoption of the Proposed Amendments, and the notice included a request for public comments and input on the Proposed Amendments;

WHEREAS, the Board of Directors of the Air District held a public hearing on December 19, 2018 to consider the Proposed Amendments in accordance with all provisions of law ("Public Hearing");

WHEREAS, at the Public Hearing, the subject matter of the Proposed Amendments was discussed with interested persons in accordance with all provisions of law;

WHEREAS, Air District staff has prepared and presented to the Board of Directors a detailed Staff Report regarding the Proposed Amendments, which Staff Report has been considered by this Board and is incorporated herein by reference;

WHEREAS, the Board of Directors finds and determines that the Proposed Amendments are considered a "project" pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 *et seq.*);

WHEREAS, the Air District is the CEQA lead agency for this project pursuant to CEQA Guidelines § 15050 (14 California Code of Regulations ("CCR") § 15050);

WHEREAS, Air District staff contracted with Environmental Audit, Inc., of Placentia, California to prepare an assessment of the potential environmental effects from the adoption and implementation of the Proposed Amendments;

WHEREAS, Environmental Audit, Inc., prepared an Initial Study as required by CEQA, in which the potential environmental effects from the adoption and implementation of proposed revisions to three rules, including the Proposed Amendments, were analyzed, and subsequently prepared a Draft Environmental Impact Report because the Initial

Study identified a potentially significant effect on the environment associated with one of the three proposed rulemaking projects, though not with the Proposed Amendments;

WHEREAS, the Draft Environment Impact Report found no evidence in the record before the District that there could be a significant effect on the environment from the adoption and implementation of the Proposed Amendments;

WHEREAS, that Draft Environmental Impact Report was offered for and subjected to public review and comment (Public Resources Code §§ 21082.1, 21091, 21092; California Code of Regulations, title 14, § 15070 *et seq.*);

WHEREAS, public notice was provided, and copies of the Draft Environmental Impact Report were made available to all interested persons and an adequate comment period of at least 45 days was provided pursuant to CEQA Guidelines § 15105, subdivision (b);

WHEREAS, no comments were received on the Draft Environmental Impact Report;

WHEREAS, Air District staff, in exercising its independent judgment, has determined that there is no substantial evidence, in light of the whole record before the Air District, that the adoption and implementation of the Proposed Amendments could have a significant effect on the environment;

WHEREAS, it is necessary that the adequacy of the Draft Environmental Impact Report be determined by the Board of Directors prior to its adoption;

WHEREAS, the members of the Board of Directors voting on this Resolution have reviewed and considered the Draft Environmental Impact Report;

WHEREAS, the Board of Directors finds and determines that in light of the whole record before it (which specifically includes the Initial Study and the Draft Environmental Impact Report), the Proposed Amendments will not have any significant effect on the environment, and the Environmental Impact Report reflects the Air District's independent judgment and analysis;

WHEREAS, the Staff Report explains that the Proposed Amendments will have no impacts on costs, and therefore will have no socioeconomic impacts;

WHEREAS, the Board of Directors finds and determines that there are no socioeconomic impacts to consider pursuant to the requirements of Health & Safety Code § 40728.5;

WHEREAS, the Board of Directors, pursuant to the requirements of Health & Safety Code § 40920.6, has actively considered the incremental cost-effectiveness of the Proposed Amendments in meeting emission reduction goals under the California Clean Air Act as set forth in the Staff Report, and finds and determines that there are no incrementally more cost-effective potential control options that would achieve the emission reduction objectives of the Proposed Amendments;

WHEREAS, the Air District has prepared, pursuant to the requirements of Health & Safety Code § 40727.2, a written analysis of federal, state, and District requirements applicable to this source category and has found that the Proposed Amendments would not be conflict with any federal, state, or other Air District rules, and the Board of Directors has agreed with these findings;

WHEREAS, the documents and other materials that constitute the record of proceedings on which this rulemaking project is based are located at the Bay Area Air Quality Management District, 375 Beale Street, San Francisco, 94105, and the custodian for these documents is Marcy Hiratzka, Clerk of the Boards;

WHEREAS, Air District staff recommends adoption of the Proposed Amendments and adoption of the Environmental Impact Report for this rulemaking project;

WHEREAS, the Board of Directors concurs with Air District staff's recommendations and desires to adopt the Proposed Amendments and to adopt the Environmental Impact Report for the Proposed Amendments to comply with CEQA;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Proposed Amendments, pursuant to the authority granted by law, as set forth in Attachment A hereto, and discussed in the Staff Report (including Appendices) with instructions to Air District staff to correct any typographical or formatting errors before final publication of the Proposed Amendments.

BE IT FURTHER RESOLVED, that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Environmental Impact Report pursuant to CEQA for the Proposed Amendments.

The foregoing Resolution was duly and regularly introduced, passed and adopted at a regular meeting of the Board of Directors of the Bay Area Air Quality Management District on the Motion of Director _____, seconded by Director _____, on the 19th day of December, 2018 by the following vote of the Board:

AYES:

NOES:

ABSENT:

David E. Hudson
Chairperson of the Board of Directors

ATTEST:

Rod Sinks
Secretary of the Board of Directors

DRAFT

ATTACHMENT A

[PROPOSED AMENDMENTS]

**Amended Regulation 6, Rule 5: Particulate Emissions from
Refinery Fluidized Catalytic Crackers**

DRAFT

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

RESOLUTION NO. 2018-

**A Resolution of the Board of Directors of the
Bay Area Air Quality Management District
Amending District Regulation 11, Rule 10: Hexavalent Chromium Emissions from
All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery
Cooling Towers; and Adopting a CEQA Environmental Impact Report for the
Project**

WHEREAS, public hearings have been properly noticed in accordance with the provisions of Health & Safety Code § 40725;

WHEREAS, the Board of Directors of the Bay Area Air Quality Management District (“Air District”) has determined that a need exists to amend District rules and regulations by adopting amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; as set forth in Attachment A hereto (“Proposed Amendments”);

WHEREAS, the Board of Directors of the Air District obtains its authority to adopt, amend or repeal rules and regulations from Sections 40000, 40001, 40702, and 40725 through 40728.5, of the California Health & Safety Code;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are written and displayed so that their meaning can be easily understood by the persons directly affected by the rule;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are in harmony with and not in conflict with or contradictory to existing statutes, court decisions, and state and federal regulations;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments do not impose the same requirements as any existing state or federal regulation, and are necessary and proper to execute the power and duties granted to, and imposed upon, the Air District;

WHEREAS, the Board of Directors of the Air District, by adopting the Proposed Amendments, is implementing, interpreting or making specific the provisions of Health & Safety Code § 40001 (rules to achieve ambient air quality standards), and § 40702 (rulemaking actions that are necessary and proper to execute the powers and duties granted to it);

WHEREAS, the Board of Directors of the Air District last amended Regulation 11, Rule 10 on December 16, 2015;

WHEREAS, in response to a lawsuit filed by the Western States Petroleum Association and three Bay Area refineries, the Air District entered into a settlement agreement with these parties dated March 24, 2017 in which Air District staff committed to propose revisions similar to the Proposed Revisions to the District Board of Directors for adoption;

WHEREAS, Air District staff has determined that Proposed Revisions are appropriate modifications to Regulation 11, Rule 10;

WHEREAS, the Air District prepared initial draft amendments, published them for comment on August 1, 2018;

WHEREAS, on July 25, 2018, Air District staff discussed the Proposed Amendments with the Ad Hoc Refinery Oversight Committee of the Board of Directors of the Air District;

WHEREAS, on October 24, 2018, the Air District transmitted the text of the Proposed Amendments to California Air Resources Board;

WHEREAS, on or before October 22, 2018, Air District staff published in newspapers and distributed and published on the District's website a notice of a public hearing to be held on December 19, 2018 to consider adoption of the Proposed Amendments, and the notice included a request for public comments and input on the Proposed Amendments;

WHEREAS, the Board of Directors of the Air District held a public hearing on December 19, 2018 to consider the Proposed Amendments in accordance with all provisions of law ("Public Hearing");

WHEREAS, at the Public Hearing, the subject matter of the Proposed Amendments was discussed with interested persons in accordance with all provisions of law;

WHEREAS, Air District staff has prepared and presented to the Board of Directors a detailed Staff Report regarding the Proposed Amendments, which Staff Report has been considered by this Board and is incorporated herein by reference;

WHEREAS, the Board of Directors finds and determines that the Proposed Amendments are considered a "project" pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 *et seq.*);

WHEREAS, the Air District is the CEQA lead agency for this project pursuant to CEQA Guidelines § 15050 (14 California Code of Regulations ("CCR") § 15050);

WHEREAS, Air District staff contracted with Environmental Audit, Inc., of Placentia, California to prepare an assessment of the potential environmental effects from the adoption and implementation of the Proposed Amendments;

WHEREAS, Environmental Audit, Inc., prepared an Initial Study as required by CEQA, in which the potential environmental effects from the adoption and implementation of proposed revisions to three rules, including the Proposed Amendments, were analyzed, and subsequently prepared a Draft Environmental Impact Report because the Initial Study identified a potentially significant effect on the environment associated with the Proposed Amendments;

WHEREAS, the Draft Environment Impact Report found no evidence in the record before the District that there could be a significant effect on the environment from the adoption and implementation of the Proposed Amendments because there would be no actual emissions increase relative to Regulation 11, Rule 10 as it has been implemented;

WHEREAS, the Draft Environmental Impact Report also found that, in comparing the Proposed Amendments to Regulation 11, Rule 10 as it was adopted (but not implemented), there is a theoretical difference in emissions reductions, and that these foregone emissions reductions could have a significant effect on the environment;

WHEREAS, that Draft Environmental Impact Report was offered for and subjected to public review and comment (Public Resources Code §§ 21082.1, 21091, 21092; California Code of Regulations, title 14, § 15070 *et seq.*);

WHEREAS, public notice was provided and copies of the Draft Environmental Impact Report were made available to all interested persons and an adequate comment period of at least 45 days was provided pursuant to CEQA Guidelines § 15105, subdivision (b);

WHEREAS, no comments were received on the Draft Environmental Impact Report;

WHEREAS, Air District staff, in exercising its independent judgment, has determined that there is no substantial evidence, in light of the whole record before the Air District, that the adoption and implementation of the Proposed Amendments could have a significant effect on the environment;

WHEREAS, Air District staff, in exercising its independent judgment, has determined that even if theoretical foregone emissions reductions are considered to be a significant impact for CEQA purposes, there are no feasible means of mitigating these foregone emissions reductions to a less than significant level;

WHEREAS, it is necessary that the adequacy of the Draft Environmental Impact Report be determined by the Board of Directors prior to its adoption;

WHEREAS, the members of the Board of Directors voting on this Resolution have reviewed and considered the Draft Environmental Impact Report;

WHEREAS, the Board of Directors finds and determines that in light of the whole record before it (which specifically includes the Initial Study and the Draft Environmental Impact Report), the Proposed Amendments will not have any significant effect on the

environment, and the Environmental Impact Report reflects the Air District's independent judgment and analysis;

WHEREAS, the Board of Directors finds and determines that in light of the whole record before it (which specifically includes the Initial Study and the Draft Environmental Impact Report), to the extent there is a theoretical significant emissions impact from foregone emissions reductions from the Proposed Amendments, there are no feasible means of reducing the impact to a less than significant level, and the Environmental Impact Report reflects the Air District's independent judgment and analysis;

WHEREAS, the Staff Report explains that the Proposed Amendments will have no impacts on costs, and therefore will have no socioeconomic impacts;

WHEREAS, the Board of Directors finds and determines that there are no socioeconomic impacts to consider pursuant to the requirements of Health & Safety Code § 40728.5;

WHEREAS, the Board of Directors, pursuant to the requirements of Health & Safety Code § 40920.6, has actively considered the incremental cost-effectiveness of the Proposed Amendments in meeting emission reduction goals under the California Clean Air Act as set forth in the Staff Report, and finds and determines that there are no incrementally more cost-effective potential control options that would achieve the emission reduction objectives of the Proposed Amendments;

WHEREAS, the Air District has prepared, pursuant to the requirements of Health & Safety Code § 40727.2, a written analysis of federal, state, and District requirements applicable to this source category and has found that the Proposed Amendments would not be conflict with any federal, state, or other Air District rules, and the Board of Directors has agreed with these findings;

WHEREAS, the documents and other materials that constitute the record of proceedings on which this rulemaking project is based are located at the Bay Area Air Quality Management District, 375 Beale Street, San Francisco, 94105, and the custodian for these documents is Marcy Hiratzka, Clerk of the Boards;

WHEREAS, Air District staff recommends adoption of the Proposed Amendments and adoption of the Environmental Impact Report for this rulemaking project;

WHEREAS, the Board of Directors concurs with Air District staff's recommendations and desires to adopt the Proposed Amendments and to adopt the Environmental Impact Report for the Proposed Amendments to comply with CEQA;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Proposed Amendments, pursuant to the authority granted by law, as set forth in Attachment A hereto, and discussed in the Staff Report (including Appendices) with instructions to Air District staff to correct any typographical or formatting errors before final publication of the Proposed Amendments.

BE IT FURTHER RESOLVED, that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Environmental Impact Report pursuant to CEQA for the Proposed Amendments.

DRAFT

The foregoing Resolution was duly and regularly introduced, passed and adopted at a regular meeting of the Board of Directors of the Bay Area Air Quality Management District on the Motion of Director _____, seconded by Director _____, on the 19th day of December, 2018 by the following vote of the Board:

AYES:

NOES:

ABSENT:

David E. Hudson
Chairperson of the Board of Directors

ATTEST:

Rod Sinks
Secretary of the Board of Directors

ATTACHMENT A

[PROPOSED AMENDMENTS]

**Amended Regulation 11, Rule 10: Hexavalent Chromium
Emissions from All Cooling Towers and Total Hydrocarbon
Emissions from Petroleum refinery Cooling Towers**

DRAFT

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

RESOLUTION NO. 2018-

**A Resolution of the Board of Directors of the
Bay Area Air Quality Management District
Amending District Regulation 12, Rule 15: Petroleum Refinery Emissions Tracking;
and Adopting a CEQA Environmental Impact Report for the Project**

WHEREAS, public hearings have been properly noticed in accordance with the provisions of Health & Safety Code § 40725;

WHEREAS, the Board of Directors of the Bay Area Air Quality Management District (“Air District”) has determined that a need exists to amend District rules and regulations by adopting amendments to Regulation 12, Rule 15: Petroleum Refinery Emissions Tracking; as set forth in Attachment A hereto (“Proposed Amendments”);

WHEREAS, the Board of Directors of the Air District obtains its authority to adopt, amend or repeal rules and regulations from Sections 40000, 40001, 40702, and 40725 through 40728.5, of the California Health & Safety Code;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are written and displayed so that their meaning can be easily understood by the persons directly affected by the rule;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments are in harmony with and not in conflict with or contradictory to existing statutes, court decisions, and state and federal regulations;

WHEREAS, the Board of Directors of the Air District has determined that the Proposed Amendments do not impose the same requirements as any existing state or federal regulation, and are necessary and proper to execute the power and duties granted to, and imposed upon, the Air District;

WHEREAS, the Board of Directors of the Air District, by adopting the Proposed Amendments, is implementing, interpreting or making specific the provisions of Health & Safety Code § 40001 (rules to achieve ambient air quality standards), and § 40702 (rulemaking actions that are necessary and proper to execute the powers and duties granted to it);

WHEREAS, the Board of Directors of the Air District adopted Regulation 12, Rule 15 on April 20, 2016;

WHEREAS, in response to a lawsuit filed by the Western States Petroleum Association and three Bay Area refineries, the Air District entered into a settlement agreement with these parties dated March 1, 2018 in which the Air District committed to propose

revisions similar to the Proposed Revisions to the District Board of Directors for adoption;

WHEREAS, Air District staff has determined that Proposed Revisions are appropriate modifications to and clarifications of the original intent of Regulation 12, Rule 15;

WHEREAS, the Air District prepared initial draft amendments, published them for comment on August 1, 2018;

WHEREAS, on July 25, 2018, Air District staff discussed the Proposed Amendments with the Ad Hoc Refinery Oversight Committee of the Board of Directors of the Air District;

WHEREAS, on October 24, 2018, the Air District transmitted the text of the Proposed Amendments to California Air Resources Board;

WHEREAS, on or before October 22, 2018, Air District staff published in newspapers and distributed and published on the District's website a notice of a public hearing to be held on December 19, 2018 to consider adoption of the draft amendments, and the notice included a request for public comments and input on the draft amendments;

WHEREAS, the Board of Directors of the Air District held a public hearing on December 19, 2018 to consider the Proposed Amendments in accordance with all provisions of law ("Public Hearing");

WHEREAS, at the Public Hearing, the subject matter of the Proposed Amendments was discussed with interested persons in accordance with all provisions of law;

WHEREAS, Air District staff has prepared and presented to the Board of Directors a detailed Staff Report regarding the Proposed Amendments, which Staff Report has been considered by this Board and is incorporated herein by reference;

WHEREAS, the Board of Directors finds and determines that the Proposed Amendments are considered a "project" pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 *et seq.*);

WHEREAS, the Air District is the CEQA lead agency for this project pursuant to CEQA Guidelines § 15050 (14 California Code of Regulations ("CCR") § 15050);

WHEREAS, Air District staff contracted with Environmental Audit, Inc., of Placentia, California to prepare an assessment of the potential environmental effects from the adoption and implementation of the Proposed Amendments;

WHEREAS, Environmental Audit, Inc., prepared an Initial Study as required by CEQA, in which the potential environmental effects from the adoption and implementation of proposed revisions to three rules, including the Proposed Amendments, were analyzed, and subsequently prepared a Draft Environmental Impact Report because the Initial

Study identified a potentially significant effect on the environment associated with one of the three proposed rulemaking projects, though not with the Proposed Amendments;

WHEREAS, the Draft Environment Impact Report found no evidence in the record before the District that there could be a significant effect on the environment from the adoption and implementation of the Proposed Amendments;

WHEREAS, that Draft Environmental Impact Report was offered for and subjected to public review and comment (Public Resources Code §§ 21082.1, 21091, 21092; California Code of Regulations, title 14, § 15070 *et seq.*);

WHEREAS, public notice was provided, and copies of the Draft Environmental Impact Report were made available to all interested persons and an adequate comment period of at least 45 days was provided pursuant to CEQA Guidelines § 15105, subdivision (b);

WHEREAS, no comments were received on the Draft Environmental Impact Report;

WHEREAS, Air District staff, in exercising its independent judgment, has determined that there is no substantial evidence, in light of the whole record before the Air District, that the adoption and implementation of the Proposed Amendments could have a significant effect on the environment;

WHEREAS, it is necessary that the adequacy of the Draft Environmental Impact Report be determined by the Board of Directors prior to its adoption;

WHEREAS, the members of the Board of Directors voting on this Resolution have reviewed and considered the Draft Environmental Impact Report;

WHEREAS, the Board of Directors finds and determines that in light of the whole record before it (which specifically includes the Initial Study and the Draft Environmental Impact Report), the Proposed Amendments will not have any significant effect on the environment, and the Environmental Impact Report reflects the Air District's independent judgment and analysis;

WHEREAS, the Staff Report explains that the Proposed Amendments will have no impacts on costs, and therefore will have no socioeconomic impacts;

WHEREAS, the Board of Directors finds and determines that there are no socioeconomic impacts to consider pursuant to the requirements of Health & Safety Code § 40728.5;

WHEREAS, the Board of Directors, pursuant to the requirements of Health & Safety Code § 40920.6, has actively considered the incremental cost-effectiveness of the Proposed Amendments in meeting emission reduction goals under the California Clean Air Act as set forth in the Staff Report, and finds and determines that there are no incrementally more cost-effective potential control options that would achieve the emission reduction objectives of the Proposed Amendments;

WHEREAS, the Air District has prepared, pursuant to the requirements of Health & Safety Code § 40727.2, a written analysis of federal, state, and District requirements applicable to this source category and has found that the Proposed Amendments would not be conflict with any federal, state, or other Air District rules, and the Board of Directors has agreed with these findings;

WHEREAS, the documents and other materials that constitute the record of proceedings on which this rulemaking project is based are located at the Bay Area Air Quality Management District, 375 Beale Street, San Francisco, 94105, and the custodian for these documents is Marcy Hiratzka, Clerk of the Boards;

WHEREAS, Air District staff recommends adoption of the Proposed Amendments and adoption of the Environmental Impact Report for this rulemaking project;

WHEREAS, the Board of Directors concurs with Air District staff's recommendations and desires to adopt the Proposed Amendments and to adopt the Environmental Impact Report for the Proposed Amendments to comply with CEQA;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Proposed Amendments, pursuant to the authority granted by law, as set forth in Attachment A hereto, and discussed in the Staff Report (including Appendices) with instructions to Air District staff to correct any typographical or formatting errors before final publication of the Proposed Amendments.

BE IT FURTHER RESOLVED, that the Board of Directors of the Bay Area Air Quality Management District does hereby adopt the Environmental Impact Report pursuant to CEQA for the Proposed Amendments.

The foregoing Resolution was duly and regularly introduced, passed and adopted at a regular meeting of the Board of Directors of the Bay Area Air Quality Management District on the Motion of Director _____, seconded by Director _____, on the 19th day of December, 2018 by the following vote of the Board:

AYES:

NOES:

ABSENT:

David E. Hudson
Chairperson of the Board of Directors

ATTEST:

Rod Sinks
Secretary of the Board of Directors

ATTACHMENT A

[PROPOSED AMENDMENTS]

**Amended Regulation 12, Rule 15: Petroleum Refinery
Emissions Tracking**

DRAFT



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

PUBLIC HEARING NOTICE

October 22, 2018

TO: INTERESTED PARTIES
FROM: EXECUTIVE OFFICER / APCO
SUBJECT: **PUBLIC HEARING: PROPOSED AMENDMENTS TO REGULATION 6, RULE 5: PARTICULATE MATTER FROM REFINERY FLUIDIZED CATALYTIC CRACKING UNITS; PROPOSED AMENDMENTS TO REGULATION 11, RULE 10: HEXAVALENT CHROMIUM EMISSIONS FROM ALL COOLING TOWERS AND TOTAL HYDROCARBON EMISSIONS FROM PETROLEUM REFINERY COOLING TOWERS; PROPOSED AMENDMENTS TO REGULATION 12, RULE 15: PETROLEUM REFINING EMISSIONS TRACKING; AND CERTIFICATION OF THE FINAL ENVIRONMENTAL IMPACT REPORT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

On **Wednesday, December 19, 2018**, the Board of Directors of the Bay Area Air Quality Management District will conduct a public hearing at the Air District Headquarters' Board Room, 375 Beale Street, San Francisco, California, at 9:30 a.m.

The Board will consider:

- Adoption of proposed amendments to Regulation 6, Rule 5: Particulate Matter from Refinery Fluid Catalytic Cracking Units;
- Adoption of proposed amendments to Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers;
- Adoption of proposed amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking; and
- Certification of a Final Environmental Impact Report pursuant to the California Environmental Quality Act (CEQA).

Project Title:

Amendments to Refinery Rules (6-5, 11-10, 12-15)

State Clearinghouse Number: 2018082001

Project Location:

Amendments to the three Refinery rules apply within the Bay Area Air Quality Management District (“District”), 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.

Projects’ Descriptions:

Amendments to the three Refinery rules clarify exemptions, definitions, and requirements for specific sections of all three rules.

- Amendments to Rule 6-5 are simply clarifications of original intent.
- Amendments to Rule 11-10 reduce monitoring of cooling towers for hydrocarbon leaks from daily to weekly, with provisions to extend monitoring periods after proving no leaks for an extended time. Costs for daily monitoring were found to be excessive relative to the potential hydrocarbon emission reductions. Requirements for cooling tower best management practices and reporting were eliminated when found to be focused primarily on Process Safety Management and cooling water chemistry rather than leak detection.
- Amendments to Rule 12-15 established thresholds for reporting requirements for non-crude oil feedstock imports, and processes for handling and securing confidential information were clarified.

Significant Impacts: Air quality impacts will be significant because the proposed amendments to Rule 11-10 involve changing existing monitoring requirements for refinery cooling towers. The greatest impact is that potential foregone ROG emission reductions as a result of the proposed project could theoretically exceed the significance threshold of 10 tons per year. Operational ROG emissions are an ozone precursor and the Air District is not in attainment for ozone; since ROG emissions might exceed the significance threshold, the proposed amendments to Rule 11-10 may contribute to an air quality violation.

The only feasible method to reduce ROG emissions from cooling towers is more frequent monitoring and repair, but this method was concluded to not be feasible due to economic factors as per CEQA Guidelines §15364. Thus, no feasible mitigation measures have been identified that could avoid the significant impact or reduce the impact to less than significant.

Pursuant to the California Environmental Quality Act (Public Resources Code § 21000 et seq.), notice is hereby given that the Air District Board of Directors will consider certification of the Environmental Impact Report regarding the proposed

amendments to all three regulations pursuant to Public Resources Code 15206, 15087(c) and section 21080(d) and CEQA Guidelines §15088 et seq.

The Public Hearing Notice, proposed rule amendments, staff report, and draft EIR are available at the Air District headquarters, on the website at <http://www.baaqmd.gov/ruledev>, or by request. Requests for copies of the proposed amended rules, staff report, or draft EIR should be directed to Karen Fremming (kfremming@baaqmd.gov) at (415) 749-8427. Comments relating to the proposed amended rules and environmental analysis should be addressed to Victor Douglas, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to vdouglas@baaqmd.gov. Comments on the proposed amended rules and draft EIR will be accepted from October 19, 2018 until December 7, 2018 at 5:00 p.m. Verbal comments are welcome up to the day of, and during, the Public Hearing.

**REGULATION 6
PARTICULATE MATTER
RULE 5
PARTICULATE EMISSIONS FROM REFINERY FLUIDIZED CATALYTIC
CRACKING UNITS**

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**REGULATION 6
PARTICULATE MATTER
RULE 5
PARTICULATE EMISSIONS FROM REFINERY FLUIDIZED CATALYTIC
CRACKING UNITS**

(Adopted December 16, 2015)

6-5-100 GENERAL

6-5-101 Description: This rule limits the emissions of condensable particulate matter emissions from petroleum refinery fluidized catalytic cracking units (FCCUs) as well as emissions of precursors of secondary particulate matter. Regulation 6, Rule 1 addresses filterable particulate emissions from FCCUs. For the purposes of this rule, commingled ammonia, condensable particulate and sulfur dioxide emissions from an FCCU and one or more other sources from a single exhaust point shall all be considered to be FCCU emissions.

6-5-110 EXEMPTIONS

6-5-111 Exemption, Emissions Abated by Wet Scrubber: The [requirements of this rule](#) ~~emission limits in Section 6-5-301~~ shall not apply to [sources emissions](#) that are abated by a wet scrubber that is required to be operated by a District permit and that constitutes best available control technology (BACT) for any pollutant [when permitted or constructed](#).

6-5-112 Limited Exemption, Emissions during Startup or Shutdown Periods: The requirements of Section 6-5-301 shall not apply to emissions during an FCCU startup or shutdown period. FCCU startup and shutdown periods shall be as defined in this rule, unless a different period is specified in a District Permit to Operate for an FCCU, in which case the Permit to Operate shall take precedence. This exemption is also applicable to a non-FCCU source with startup or shutdown provisions specified in a Permit to Operate, if that source is subject to the requirements of Section 6-5-301 because the source emissions are commingled with those of an FCCU at a single exhaust point; the startup or shutdown provisions specified in the Permit to Operate shall be the basis for this exemption. Whenever this exemption applies to any source, it shall apply to all sources with commingled emissions.

6-5-113 Limited Exemption, Installation of Wet Scrubber: The emission limit effective date for ammonia in Section 6-5-301 may be extended to a later date specified in a District Authority to Construct for an existing FCCU to be controlled with a new wet scrubber, but may not be extended by more than 36 months.

6-5-114 Limited Exemption, FCCU without Nitrogen-Based Additives: The emission limit for ammonia in Section 6-5-301 shall not apply to an FCCU where ammonia, urea or any other nitrogen-based additive is not used in a way that contributes to ammonia or condensable particulate FCCU emissions.

6-5-115 Limited Exemption, Ammonia Optimization: The ammonia emission limit in Section 6-5-301 shall not apply to the owner/operator of a refinery that implements an optimization of ammonia and/or urea injection in accordance with Section 6-5-403.

6-5-200 DEFINITIONS

6-5-201 Ammonia Slip: Ammonia slip is the amount of unreacted ammonia emitted to the atmosphere from the FCCU, regardless of the source of the ammonia.

6-5-202 Catalyst Regeneration Unit (CRU): A catalyst regeneration unit regenerates spent FCCU catalyst by burning off the coke that has deposited on the catalyst surface. The resulting CRU flue gas is the primary emission source addressed by this rule.

- 6-5-203 Condensable Particulate Matter:** Liquid droplets that coalesce, or gaseous emissions that condense to form liquid or solid particles. These liquid and/or solid particles are identified as condensable organic or condensable inorganic particulate matter using EPA Test Method 202.
- 6-5-204 Daily Average:** The arithmetic mean of the measured ammonia emissions subject to Section 6-5-301 on any calendar day that the FCCU operates.
- 6-5-205 FCCU Shutdown:** Unless otherwise specified in a District Permit to Operate, FCCU shutdown is a period which begins when fresh feed flow to the FCCU reactor stops and ends when the main blower for catalyst recirculation is shutdown.
- 6-5-206 FCCU Startup:** Unless otherwise specified in a District Permit to Operate, FCCU startup is a period not exceeding 120 hours which begins with the startup of the main blower for introduction of catalyst and ends after fresh feed is introduced to the FCCU reactor, when the process reaches steady state.
- 6-5-207 Fluidized Catalytic Cracking Unit (FCCU):** A fluidized catalytic cracking unit (FCCU) is a processing unit that converts heavy petroleum fractions, typically from crude oil distillation units, into lighter fuel intermediates by using a fine, powdered catalyst to promote a chemical reaction in which the heavy petroleum molecules are broken into smaller molecules. In addition to the cracking reactor, an FCCU includes a catalyst regeneration unit (CRU), ancillary equipment including blowers, and all equipment for controlling air pollutant emissions and recovering heat.
- 6-5-208 Petroleum Refinery:** An establishment that is located on one or more contiguous or adjacent properties that processes crude oil to produce more usable products such as gasoline, diesel fuel, aviation fuel, lubricating oils, asphalt or petrochemical feedstocks. Petroleum refinery processes include separation processes (e.g., atmospheric or vacuum distillation, and light ends recovery), petroleum conversion processes (e.g., cracking, reforming, alkylation, polymerization, isomerization, coking, and visbreaking) petroleum treating processes (e.g., hydrodesulfurization, hydrotreating, chemical sweetening, acid gas removal, and deasphalting), feedstock and product handling (e.g., storage, blending, loading, and unloading), auxiliary facilities (e.g., boilers, waste water treatment, hydrogen production, sulfur recovery plant, cooling towers, blowdown systems, compressor engines, and power plants).
- 6-5-209 Primary Particulate Matter:** Material emitted to the atmosphere as filterable or condensable particulate matter.
- 6-5-210 Secondary Particulate Matter:** Material emitted to the atmosphere in a gaseous form that will not coalesce or condense to a solid or liquid form at atmospheric temperature and pressure, but that may react in the atmosphere into a solid or liquid form. For the purposes of this rule, precursors of Secondary Particulate Matter shall include sulfur dioxide (SO₂) and ammonia.
- 6-5-211 Wet Scrubber:** A device that removes air pollutants from gas streams by contacting the gas stream with a scrubbing liquid.

6-5-300 STANDARDS

6-5-301 Fluidized Catalytic Cracking Unit (FCCU) Emission Limits: The owner/operator of a Petroleum Refinery that includes an FCCU shall not cause emissions to the atmosphere from the FCCU that exceed the limits in Table 1 on or after the indicated effectiveness date:

Table 1 – FCCU Emission Limits		
Pollutant	Emission Limit	Effective Date
Ammonia	10 ppmvd at 3% O ₂ as a daily average	January 1, 2018
Condensable Particulate Matter	{future}	{future}
Sulfur Dioxide (SO₂)	{future}	{future}

6-5-400 ADMINISTRATIVE REQUIREMENTS

6-5-401 Ammonia Control Plan and Permit Applications: No later than January 1, 2017, the owner/operator of a Petroleum Refinery subject to the ammonia emission limit in Section 6-5-301 shall submit to the APCO a control plan detailing the measures, if any, to be taken in order to meet the requirements of Section 6-5-301, and also applications for all Authorities to Construct necessary for compliance with Section 6-5-301.

6-5-402 Ammonia Monitoring Plan: No later than January 1, 2017, the owner/operator of a Petroleum Refinery that includes an FCCU subject to the ammonia emission limit in Section 6-5-301 shall submit to the APCO a plan for the installation of an ammonia monitoring system to perform monitoring as required by Section 6-5-501. This plan shall identify the proposed monitoring technique, monitoring equipment, installation details and installation schedule.

6-5-403 Ammonia Optimization: As an alternative to compliance with the ammonia emission limit of Section 6-5-301, the owner/operator of a refinery may instead establish an enforceable ammonia emission limit for the FCCU that results in the minimization of total FCCU PM_{2.5} emissions (including all condensable particulate matter), as follows:

- 403.1 No later than March 1, 2016, the refinery owner/operator shall submit to the APCO an Optimization and Demonstration Protocol for the purpose of establishing the minimum rate of ammonia and/or urea injection necessary to minimize total PM_{2.5} FCCU emissions (including all condensable particulate matter) while complying with all existing permit requirements, excluding permit requirements that are not based on District BACT requirements, on District prohibitory rule limits or on federal consent decrees. The Optimization Protocol shall include the ammonia and/or urea injection rates to be evaluated and the criteria for selecting these rates, and also the criteria for determining the Optimized Ammonia Emissions Concentration that minimizes total FCCU PM_{2.5} emissions.
- 403.2 Within 60 days, the APCO shall either approve or disapprove the Optimization and Demonstration Protocol.
- 403.3 The refinery owner/operator shall commence and complete the Optimization and Demonstration Protocol, approved by the APCO, no later than June 30, 2017.
- 403.4 The refinery owner/operator shall report to the APCO the results of the Optimization and Demonstration Protocol and the proposed Optimized Ammonia Emissions Concentration no later than August 31, 2017. No later than this same date, the refinery owner/operator shall submit a District permit application to 1) establish the Optimized Ammonia Emissions Concentration as an enforceable permit requirement, and to 2) relax any existing permit conditions that are not based on District BACT requirements, on District prohibitory rule limits or on federal consent decrees to the extent necessary to minimize total FCCU PM_{2.5} emissions.
- 403.5 Disapproval of an Optimization and Demonstration Protocol, or a failure to meet any requirement or deadline in this section shall not constitute a violation of this rule, but shall preclude the applicability of the limited exemption in Section 6-5-115.

6-5-500 MONITORING AND RECORDS

6-5-501 Ammonia Monitoring: The owner/operator of a Petroleum Refinery that includes an FCCU subject to the ammonia emission limit in Section 6-5-301 shall, no later than January 1, 2018, operate one of the following;

- 501.1 A mass-balance monitoring system that includes all of the following:
 - 1.1 Parametric monitors that comply with District Regulation 1, Section 523 to continuously measure the injection or addition rate (pounds per hour)

of ammonia, urea or any other nitrogen-based additive into the emission stream, and;

- 1.2 Continuous emission monitors that comply with District Regulation 1, Section 522 to continuously measure NOx and oxygen concentrations at appropriate locations to allow a calculation of the amount of ammonia and/or urea consumed in NOx-reduction reactions, and therefore the remaining, emitted amount of non-consumed ammonia.

501.2 Any other ammonia emission monitoring system approved in writing by the APCO.

6-5-502 Ammonia Records: The owner/operator of a Petroleum Refinery subject to the ammonia emission limit in Section 6-5-301 shall maintain records of the data required to be measured in Section 6-5-501. These records shall be kept for a period of at least five years and shall be made available to the APCO on request.

6-5-600 MANUAL OF PROCEDURES

6-5-601 Compliance Determination: All compliance determinations shall be made in the as-found operating condition. No compliance determinations shall be made during periods subject to the exemption in Section 6-5-112.

6-5-602 Determination of Ammonia and Oxygen: Determination of ammonia shall be by Regulation 1, Section 522 NOx monitors or other APCO approved ammonia monitoring system. Determination of oxygen shall be by Regulation 1, Section 522 oxygen monitor.

**REGULATION 11
HAZARDOUS POLLUTANTS
RULE 10
HEXAVALENT CHROMIUM EMISSIONS FROM ALL COOLING TOWERS AND
TOTAL HYDROCARBON EMISSIONS FROM PETROLEUM REFINERY COOLING TOWERS**

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REGULATION 11
HAZARDOUS POLLUTANTS
RULE 10
HEXAVALENT CHROMIUM EMISSIONS FROM ALL COOLING TOWERS AND
TOTAL HYDROCARBON EMISSIONS FROM PETROLEUM REFINERY COOLING TOWERS

(Adopted November 15, 1989)

11-10-100 GENERAL

11-10-101 Description: The purpose of this Rule is to reduce emissions of hexavalent chromium from all cooling towers and reduce total hydrocarbon emissions from cooling towers at petroleum refineries.

(Amended December 16, 2015)

11-10-102 Deleted December 16, 2015

11-10-103 Limited Exemption, Fin-Fan Coolers and HVAC Systems: Fin-Fan Coolers and HVAC Systems associated with petroleum refinery cooling towers are exempt from the total hydrocarbon emission requirements of this rule.

(Adopted December 16, 2015)

11-10-104 Limited Exemption, Continuous Hydrocarbon Analyzers: When a continuous hydrocarbon analyzer, as defined in Section 11-10-201, is installed pursuant to Section 11-10-602 and is used to detect total hydrocarbon concentrations in cooling tower water, the cooling tower return line (s), and/or the heat exchanger exit line(s) monitored by the analyzer(s) are exempt from the requirements of Section 11-10-402.

(Adopted December 16, 2015)

11-10-105 Limited Exemption, Recirculation Rates Less Than 500 Gallons Per Minute: Petroleum refinery cooling towers with a water recirculation rate less than 500 gallons per minute may demonstrate compliance with the requirements in Section [11-10-304 of this rule](#) by monitoring for leaks at least once every ~~week~~[14 days, rather than continuously or daily as provided for in Section 11-10-304](#), with any of the Air District approved total hydrocarbon detection methods outlined in Section 11-10-304. [A petroleum refinery may elect to move to a monthly monitoring schedule for a cooling tower as follows:](#)

[105.1 If weekly sampling or monitoring results at a particular cooling tower do not exceed the applicable leak action level for four consecutive weeks, the petroleum refinery may demonstrate compliance with the requirements in Section 11-10-304 by monitoring for leaks at least once every month at the cooling tower;](#)

[105.2 In the event that the monthly sampling or monitoring identifies a result above the applicable leak action level, the petroleum refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and](#)

[105.3 The relevant cooling tower shall be again eligible for a monthly sampling schedule after four consecutive weeks of sampling or monitoring results below the applicable leak action level.](#)

(Adopted December 16, 2015)

11-10-106 Limited Exemption, Recirculation Rates Less Than 2,500 Gallons Per Minute: Petroleum refinery cooling towers with a water recirculation rate less than 2,500 gallons per minute may demonstrate compliance with the requirements in Section [11-10-304 of this rule](#) by monitoring for leaks at least once every ~~week~~[seven days, rather than continuously or daily as provided for in Section 11-10-304](#), with any of the Air District approved total hydrocarbon detection methods outlined in Section 11-10-304. [A petroleum refinery may elect to move to a monthly monitoring schedule for a cooling tower as follows:](#)

[106.1 If weekly sampling or monitoring results at a particular cooling tower do not exceed the applicable leak action level for four consecutive weeks, the petroleum refinery may demonstrate compliance with the requirements in Section 11-10-304 by monitoring for leaks at least once every month at the cooling tower;](#)

106.2 In the event that the monthly sampling or monitoring identifies a result above the applicable leak action level, the petroleum refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and

106.3 The relevant cooling tower shall be again eligible for a monthly sampling schedule after four consecutive weeks of sampling or monitoring results below the applicable leak action level.

(Adopted December 16, 2015)

11-10-107 Limited Exemption, Cooling Towers Servicing Hydrogen Production, Carbon Dioxide Recovery and Power Generation Facilities: Cooling towers that are not in petroleum refining process service are excluded from the total hydrocarbon emission requirements of this rule. Refining process service is limited to refinery process units that handle petroleum hydrocarbons. ~~are cooling towers that are not in petroleum refining process service.~~ Specific examples of cooling towers not in petroleum refining process service are including those that serve power generation operations, hydrogen production facilities and carbon dioxide recovery facilities located at petroleum refineries, provided they are not involved with the refining of crude oil and their cooling systems are separate from those used in petroleum refining operations. Cooling towers serving sulfur plants, lube oil streams, and amine streams will be evaluated on a case-by-case basis, and the APCO shall determine if the cooling tower is subject to the total hydrocarbon requirements of this rule.

(Adopted December 16, 2015)

11-10-200 DEFINITIONS

11-10-201 Continuous Hydrocarbon Analyzer: An Air District-approved parametric monitoring device that measures total hydrocarbon concentration to detect leaks in a heat exchanger system.

(Adopted December 16, 2015)

11-10-202 Cooling Tower: A device used to remove heat from circulating cooling water systems by transferring heat to the atmosphere using either a natural or mechanical draft.

(Renumbered, Amended December 16, 2015)

11-10-203 Hexavalent Chromium/Chromate: Hexavalent chromium is a cancer-causing (toxic) substance existing as part of various inorganic chromate compounds, for example, sodium dichromate or lead chromate.

(Prior Section 11-10-203 Deleted 12/16/15; Current Section 11-10-203 Adopted 12/16/15)

11-10-204 Leak Action Level: A total hydrocarbon concentration greater than any one of the following:

204.1 84 ppbw (as methane) as measured in cooling tower water prior to exposure to air for cooling towers in operation prior to July 1, 2016, or 42 ppbw (as methane) as measured in cooling tower water prior to exposure to air for new or modified cooling towers operating on or after July 1, 2016.

204.2 6 ppmv (as methane) as measured in stripped air by a continuous hydrocarbon analyzer or an APCO approved alternative method.

(Adopted December 16, 2015)

11-10-205 Leak Repair: A leak repair shall reduce the concentration of total hydrocarbon in cooling tower water to comply with the applicable leak action level and may include but not be limited to the following actions:

205.1 Permanent physical repair of leaking equipment, replacement of equipment, and/or blocking or plugging equipment.

205.2 Replacing the leaking heat exchanger or heat exchanger bundle; or permanently isolating, bypassing, or otherwise removing the leaking heat exchanger from service until it is repaired.

(Adopted December 16, 2015)

11-10-206 Petroleum Refinery: An establishment that is located on one or more contiguous or adjacent properties that processes crude oil to produce more usable products such as gasoline, diesel fuel, aviation fuel, lubricating oils, asphalt or petrochemical feedstocks. Petroleum refinery processes include separation processes (e.g., atmospheric or vacuum distillation, and light ends recovery), petroleum conversion processes (e.g., cracking, reforming, alkylation, polymerization, isomerization, coking, and visbreaking) petroleum treating processes (e.g., hydrodesulfurization, hydrotreating, chemical sweetening, acid gas removal, and deasphalting), feedstock and product handling

(e.g., storage, blending, loading, and unloading), and auxiliary facilities (e.g., boilers, waste water treatment, hydrogen production, sulfur recovery plant, cooling towers, blowdown systems, compressor engines, and power plants).

(Adopted December 16, 2015)

11-10-207 Heat Exchange System: A device or series of devices used to transfer heat from process fluids to water without intentional direct contact of the process fluid with the water (i.e., non-contact heat exchanger) and to transport and/or cool the water in a closed-loop recirculation system (cooling tower system). For closed-loop recirculation systems, the heat exchange system consists of a cooling tower, all petroleum refinery process unit heat exchangers that are serviced by that cooling tower, and all water lines to and from the petroleum refinery process unit heat exchanger(s).

(Adopted December 16, 2015)

11-10-208 Heat Exchanger: A device consisting of fins and/or tubes used to transfer heat from process equipment or process fluid streams to cooling water.

(Adopted December 16, 2015)

11-10-209 Total Hydrocarbon: Any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate.

(Adopted December 16, 2015)

11-10-210 Cooling Tower Return Line: The main water trunk lines at the inlet to the cooling tower before exposure to the atmosphere.

(Adopted December 16, 2015)

11-10-211 Heat Exchanger Exit Line: A cooling water line from the exit of one or more heat exchangers (where cooling water leaves the heat exchangers) to the entrance of the cooling tower return line.

(Adopted December 16, 2015)

11-10-300 STANDARDS

11-10-301 Hexavalent Chromium Removal: Effective March 1, 1990, a person shall not operate any cooling tower in the District that uses hexavalent chromium chemicals.

11-10-302 Deleted December 16, 2015

11-10-303 Deleted December 16, 2015

11-10-304 Total Hydrocarbon Leak Monitoring Requirement: Effective ~~July 1, 2016~~ January 1, 2019, the owner/operator of a cooling tower located at a petroleum refinery shall use one of three options to monitor for total hydrocarbon leaks from cooling towers:

304.1 Sample and analyze cooling tower water at each cooling tower return line(s), and/or at each heat exchanger exit line(s) prior to exposure to air to demonstrate compliance with the leak action level in Subsection 11-10-204.1 (84 ppbw in the cooling water for existing units and 42 ppbw for new/modified units) at least once every ~~weekcalendar day~~ (365-52 samples per year) pursuant to the requirements of Sections 11-10-603, 11-10-604 and the BAAQMD Manual of Procedures. ~~;~~ ~~or~~ A petroleum refinery may elect to move to a bi-monthly sampling schedule (two samples every month) for a cooling tower provided weekly sampling results at a particular cooling tower do not exceed the applicable leak action level for six consecutive months (26 consecutive weekly samples):

4.1.1 In the event that sampling identifies a result above the applicable leak action level, the refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and

4.1.2 The relevant cooling tower shall be again eligible for a bi-monthly sampling schedule (two samples every month) after six consecutive months of sampling results below the applicable leak action level.

304.2 Install a continuous hydrocarbon analyzer(s) at each cooling tower return line(s), and/or at each heat exchanger exit line(s) prior to exposure to air to demonstrate compliance with the leak action level in Subsection 11-10-204.2 (6 ppmv in the stripped air). The owner/operator shall ensure that the continuous hydrocarbon analyzer(s) is capable of taking at least 4 measurements every hour (96 measurements per day) ~~;~~ ~~or~~

304.3 Employ an alternative APCO-approved method to monitor each cooling tower return line(s), and/or each heat exchanger exit line(s) prior to exposure to air ~~daily~~ to demonstrate compliance with the leak action level in Subsection 11-

10-204.2 (6 ppmv in the stripped air). [Monitoring of cooling towers using an alternative APCO-approved method must meet the monitoring frequency requirements as described in Subsection 11-10-304.1.](#) Cooling tower owner/operators must receive prior approval from the APCO to use an alternative monitoring method.

(Adopted December 16, 2015)

11-10-305 Leak Action Requirement: Effective ~~July 1, 2016~~ [January 1, 2019](#), if any of the hydrocarbon leak detection methods in Section 11-10-304 result in cooling tower water containing total hydrocarbon concentrations greater than the applicable leak action level in Section 11-10-204, the cooling tower owner/operator shall minimize the leak as soon as practicable or within ~~seven~~ [5](#)-calendar days, whichever is sooner, and conduct a leak repair and/or remove the defective piece of equipment from service within ~~21~~ [21](#)-calendar days of first detecting the leak. [Any delay in completion of the leak repair beyond 21 days must meet the criteria cited in 40 C.F.R. 63.654\(f\)-\(g\).](#) The owner/operator shall also speciate and quantify the Toxic Air Contaminants (TACs) associated with the leak within ~~72 hours~~ [one calendar day](#) of discovering the leak ~~and each day thereafter until the leak is fully repaired~~, using water sampling pursuant to the requirements of Sections 11-10-603, 11-10-604 and the BAAQMD Manual of Procedures. The TACs requiring speciation and quantification are defined in Regulation 2, Rule 5, Section 2-5-222 and are summarized in Table 2-5-1 of Regulation 2, Rule 5.

(Adopted December 16, 2015)

11-10-400 ADMINISTRATIVE REQUIREMENTS

11-10-401 Petroleum Refinery Cooling Tower Reporting Requirements: When the sampling of cooling tower water exceeds the applicable leak action level the cooling tower owner/operator shall:

401.1 [Conduct sampling of total hydrocarbon concentration and chlorine concentration in the cooling water as soon as feasible, and no later than 24 hours from the time and date of leak discovery.](#) Within ~~72 hours~~ [one calendar day](#) of the time and date of leak discovery, [the owner/operator shall](#) notify the APCO of the total hydrocarbon ~~concentration, pH, iron~~ and chlorine concentration in the cooling water ~~at time and date of leak discovery. List all of the heat exchangers that are served by this cooling tower.~~

401.2 If the leak has not been repaired after 21 days, the owner/operator shall notify the APCO regarding the magnitude of the leak, the specific repairs performed to date, whether the leaking component was reinspected for leaks following the repair, the cause of the leak, whether further repair or replacement of equipment will be required at the next turnaround, whether the hydrocarbons associated with the leak were speciated and quantified, ~~and submit mass emission calculations to demonstrate the total hydrocarbon emissions from the leak are below 15 pounds per day, and the hourly and annual (if applicable) Toxic Air Contaminant (TAC) emissions from the leak are below their corresponding Acute and/or Chronic TAC trigger levels in Table 2-5-1 of Regulation 2, Rule 5.~~ [The owner/operator shall notify the APCO if the delay in completion of the leak repair beyond 21 days meets the criteria cited in 40 C.F.R. 63.654\(f\)-\(g\).](#)

(Adopted December 16, 2015)

~~**11-10-402 Best Modern Practices:** Effective July 1, 2016, the owner/operator of a cooling tower located at a petroleum refinery shall minimize total hydrocarbon emissions from cooling tower equipment and operations by employing best modern practices that shall include but are not limited to:~~

~~**402.1** Visual examination and/or non-destructive testing of all heat exchangers upstream of the cooling tower during turnaround for corrosion/damage and back flushing;~~

~~**402.2** Repassivation of the steel contained in the heat exchangers during turnaround;~~

~~**402.3** Seal tubes within the heat exchangers if there is evidence of corrosion or pitting during turnaround;~~

- ~~402.4~~ Perform visual observations, at least once every shift, of the cooling water to detect any changes in the appearance of the water that could indicate hydrocarbon contamination and confirm presence of microbial growth such as turbidity or algae growth below the water line;
- ~~402.5~~ Monitor cooling tower decks at least once every shift, if access to the decks is possible, to detect any unexpected odors from the water via the human olfactory system;
- ~~402.6~~ Measure the residual chlorine in the cooling tower water once every shift;
- ~~402.7~~ Use hand-held monitors, such as FIDs, once every shift, to detect the presence of total hydrocarbons in the air above the cooling tower water;
- ~~402.8~~ Measure the oxidation reduction potential in the cooling tower water with hand-held monitors at least once every shift; and,
- ~~402.9~~ At least once every shift, track and record the amount of chlorine (or biocide) added to the cooling tower water.

~~Data collected per the requirements in Section 11-10-402 shall be retained for at least 5 years from the date of entry and shall be analyzed in a written report by the cooling tower owner/operator once per week. The purpose of the written report is to examine for trends that could serve as an early warning/detection system for potential hydrocarbon leaks.~~

(Adopted December 16, 2015)

11-10-500 MONITORING AND RECORDS

11-10-501 Deleted December 16, 2015

11-10-502 Deleted December 16, 2015

11-10-503 Deleted December 16, 2015

11-10-504 Operating Records: Owner/operators subject to the requirements of Sections 11-10-301, 304, 305, 401, ~~402~~, 601, 602, 603 and/or 604 shall retain records of the results of all sampling and/or monitoring conducted, leak minimizations and repairs made, ~~best modern practices employed~~ and other required data on site for at least five years from the date of entry. Owner/operators claiming any of the limited exemptions from petroleum refinery cooling tower requirements in this rule shall keep records on site for at least five years to demonstrate qualification for exemption.

(Adopted December 16, 2015)

11-10-600 MANUAL OF PROCEDURES

11-10-601 Determination of Hexavalent Chromium in Circulating Water: Samples of circulating water shall be analyzed for hexavalent chromium as prescribed by American Public Health Method 312B or an equivalent method, as approved by the APCO.

11-10-602 Total Hydrocarbon Analyzer Location: Effective July 1, 2016, if the owner/operator of a cooling tower at a petroleum refinery installs one or more Air District-approved total hydrocarbon analyzers in a cooling tower to demonstrate compliance with Subsections 11-10-304.2 and 304.3, such analyzers shall be installed at: A) each cooling tower return line to continuously measure the total hydrocarbon concentration in the cooling tower water prior to exposure to air, or B) the exit line for each heat exchanger or group of heat exchangers within that heat exchanger system prior to exposure to air. Location of analyzer installations shall be subject to APCO approval. Analyzer sensitivity shall respond to the compounds being processed. Analyzers shall be maintained and operated in accordance with Regulation 1, Section 523.

(Adopted December 16, 2015)

11-10-603 Cooling Tower Water Lab Analysis Methodology: Effective July 1, 2016, when the owner/operator of a cooling tower located at a petroleum refinery performs cooling water sampling and analysis for hydrocarbon concentration in cooling tower water pursuant to Subsection 11-10-304.1, the laboratory analysis shall follow EPA Method 8015D.

(Adopted December 16, 2015)

11-10-604 Cooling Tower Water Sampling Methodology: Effective July 1, 2016, when the owner/operator of a cooling tower located at a petroleum refinery performs cooling water sampling and analysis for total hydrocarbon concentration in cooling tower water

pursuant to Subsection 11-10-304.1, the cooling water shall be sampled at each cooling tower return line(s) and/or each heat exchanger exit line(s) prior to exposure to air. Sampling methodology shall follow the BAAQMD Manual of Procedures.

(Adopted December 16, 2015)

**REGULATION 12
MISCELLANEOUS STANDARDS OF PERFORMANCE
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REGULATION 12
MISCELLANEOUS STANDARDS OF PERFORMANCE
RULE 15
PETROLEUM REFINING EMISSIONS TRACKING

(Adopted April 20, 2016)

12-15-100 GENERAL

12-15-101 Description: The purpose of this rule is to track air emissions and crude oil composition characteristics from Petroleum Refineries and Support Facilities over time and to establish air monitoring systems to provide air quality data along refinery boundaries.

12-15-200 DEFINITIONS

12-15-201 Accidental Air Release: An unanticipated emission of a criteria pollutant, toxic air contaminant, and/or greenhouse gas into the atmosphere required to be reported in a Risk Management Plan (RMP) under 40 CFR §68.168.

12-15-202 Ambient Air: The portion of the atmosphere external to buildings to which the general public has access.

12-15-203 Annual Emissions Inventory: An emissions inventory at a Petroleum Refinery covering a calendar year period.

12-15-204 Criteria Pollutant: An air pollutant for which an ambient air quality standard has been established, or that is an atmospheric precursor to such an air pollutant. For the purposes of this rule, criteria pollutants are carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter with an aerodynamic diameter of 10 micrometers or less (PM₁₀), particulate matter with an aerodynamic diameter of 2.5 micrometers or less (PM_{2.5}), precursor organic compounds (POC), and sulfur dioxide (SO₂).

12-15-205 Crude Oil / Crude Oil Blends: Unblended crude oil or blended crude oil at the first stage of processing at a Petroleum Refinery (typically at a crude distillation unit). ~~Petroleum, as it occurs after being extracted from geologic formations by an oil well, and after extraneous substances may have been removed, and which may be subsequently processed at a Petroleum Refinery.~~

12-15-206 Emissions Inventory: For purposes of this rule, an emissions inventory is a ~~A~~ comprehensive and accurate accounting of the types and quantities of criteria pollutants, toxic air contaminants, and greenhouse gases that are released into the atmosphere based on current state-of-the-art measurement technologies and estimation methodologies. It is intended to represent the actual emissions to the best precision possible based on those measurement technologies and estimation methodologies. For the purposes of this rule, emissions inventory data are data that are ~~shall be~~ collected or calculated by the Petroleum Refinery for: ~~(1) all continuous, intermittent, predictable, and accidental air releases resulting from Petroleum Refinery processes at stationary sources at a Petroleum Refinery, and (2) air releases from cargo carriers (e.g., ships and trains), excluding motor vehicles, during loading or unloading operations at a Petroleum Refinery.~~

12-15-207 Fence-line Monitoring System: Equipment that measures and records air pollutant concentrations at or near the property boundary of a facility, and which may be useful for detecting and/or estimating the quantity of fugitive emissions, gas leaks, and other air emissions from the facility.

12-15-208 Greenhouse Gases (GHGs): The air pollutant that is defined in 40 CFR § 86.1818-12(a), which is a single air pollutant made up of a combination of the following six constituents: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For the purposes of this rule, GHG emissions should be calculated in manner consistent with California Air Resources Board requirements as contained in §95113 of the Mandatory Greenhouse Gas Emissions Reporting Rule.

12-15-209 Monthly Crude Slate Report: Summaries of the volume and certain properties of crude oil / ~~or crude oil blends at the first stage of processing at a Petroleum Refinery (typically at a crude distillation unit), and of the volume and certain properties of non-crude oil feedstock or feedstock blends which have been imported from outside a Petroleum Refinery, at the point it is first introduced into any refinery processing equipment other than storage, product blending, loading or unloading.~~ The ~~crude oil~~ summary shall consist of the total volume of crude oil / crude oil blends processed in the calendar month, and single average value for each of the properties of the total volume of crude oil / crude oil blends processed for the calendar month, as listed in Section 12-15-408, Table 1.

209.1 The non-crude oil feedstock summary shall consist of the total volume and certain properties of non-crude oil feedstock / non-crude oil feedstock blends that are non-gaseous at Standard Temperature and Pressure fed to a fluidized catalyst processing unit. On a calendar month basis, the Petroleum Refinery shall document the volume of all imported feedstocks to a fluidized catalyst process unit. The Petroleum Refinery will provide a ~~processed in the calendar month, and~~ single averaged representative value for the imported feedstock to a fluidized catalyst process unit for API, sulfur, iron, nickel, and vanadium if total imported feedstocks exceed one of the following conditions in the calendar month:

209.1.1 The volume of all imported feedstocks with an API equal to or greater than 15 is greater than 20 percent of the annualized daily limit listed within a Title V permit multiplied by 30; or

209.1.2 The volume of all imported feedstocks with an API less than 15 is greater than 50,000 bbls.

209.2 Based upon the five-year monitoring results, an owner or operator of a Petroleum Refinery may request that this provision terminate with respect to that Petroleum Refinery and, in the District's sole discretion, the provision will terminate as to the specific Petroleum Refinery. The owner or operator of the Petroleum refinery must submit the request in writing. The District must grant or deny the request within 30 days of receipt of the request. If the District fails to deny the request within 30 days, such failure will be deemed approval and the provision will sunset immediately with respect to that Petroleum Refinery.

209.3 By March 1, 2023, the District will evaluate the requirement for the non-crude oil feedstock summary based on the frequency of sampling, and will propose removing this requirement unless it finds that the frequency of sampled events justifies its continuation. The District will consult with affected Petroleum Refineries prior to reaching a decision.

209.4 ~~each of the properties of the total volume of non-crude oil feedstock / non-crude oil feedstock blends processed for the calendar month, as listed in Section 12-15-408, Table 1.~~ Supporting data maintained by a Petroleum Refinery ~~information for each crude oil and each non-crude oil feedstock~~ shall be made available for inspection and audit by the APCO at the Petroleum Refinery ~~audit~~ upon request in order to verify the summary data required in Section 12-15-408, Table 1. To ensure the protection of Confidential Information and prevent its inadvertent release, the District agrees to not remove the data described in this paragraph from the Petroleum Refinery or copy any source information or supporting data as described above. The District further agrees to use the supporting data only to verify the monthly cumulative statistical analysis of the summarized information found in Table 1. If the District creates its own notes based on review of the supporting data, it will ensure that its notes will not depict the supporting data in any form or manner such that a third party could deduce or reconstruct the supporting data (sometimes colloquially referred to as "reverse-engineering"). If the District finds a discrepancy between the monthly reports and supporting data, the District shall allow the Petroleum Refinery a reasonable opportunity to correct the discrepancy. If the discrepancy is not corrected, the District may use its notes (which are and shall be treated as confidential) and previous notification to correct the discrepancy as needed to document non-compliance with this Rule. The District will treat its notes as Confidential Information unless and until

[the source of the information affirmatively and in writing indicates to the District that the information contained in the notes is no longer Confidential Information \(or a court of competent jurisdiction issues a final judgment ordering release of the information\).](#)

- 12-15-210 Petroleum Refinery:** An establishment that is located on one or more contiguous or adjacent properties that processes crude oil to produce more usable products such as gasoline, diesel fuel, aviation fuel, lubricating oils, asphalt or petrochemical feedstocks. Petroleum Refinery processes include separation processes (e.g., atmospheric or vacuum distillation, and light ends recovery), petroleum conversion processes (e.g., cracking, reforming, alkylation, polymerization, isomerization, coking, and visbreaking), petroleum treating processes (e.g., hydrodesulfurization, hydrotreating, chemical sweetening, acid gas removal, and deasphalting), feedstock and product handling (e.g., storage, crude oil blending, non-crude oil feedstock blending, product blending, loading, and unloading), and auxiliary facilities (e.g., boilers, waste water treatment, hydrogen production, sulfur recovery plant, cooling towers, blowdown systems, compressor engines, and power plants).
- 12-15-211 Source:** As defined in BAAQMD Regulation 2, Rule 1, Section 221.
- 12-15-212 Support Facility:** For purposes of this rule, a hydrogen plant, sulfuric acid plant or electrical generation plant that is not owned or operated by a Petroleum Refinery, and that provides more than 50% of its production output to a Petroleum Refinery.
- 12-15-213 Toxic Air Contaminant (TAC):** An air pollutant that may cause or contribute to an increase in mortality or in serious illness or that may pose a present or potential hazard to human health. For the purposes of this rule, TACs consist of the substances listed in the most recent health risk assessment guidelines adopted by OEHHA.

12-15-400 ADMINISTRATIVE REQUIREMENTS

12-15-401 Annual Emissions Inventory: A Petroleum Refinery or Support Facility owner/operator shall obtain and maintain APCO approval of an Annual Emissions Inventory. Timely submittal as described in the next sentence shall constitute compliance with this requirement unless and until there is a determination of disapproval by the APCO pursuant to Section 12-15-402. On or before June 30, 2017, and every subsequent June 30, a Petroleum Refinery or Support Facility owner/operator shall submit to the APCO an Annual Emissions Inventory covering the previous calendar year period in an APCO-approved format. This report shall include, at a minimum, the following:

- 401.1** Identification of the calendar year that the Annual Emissions Inventory covers.
- 401.2** A summary of the total quantity of each criteria pollutant, TAC, and GHG that was emitted from the Petroleum Refinery or Support Facility during the Annual Emission Inventory period, including a table for each source and each pollutant listing whether the pollutant was (a) continuously monitored, (b) monitored by direct measurement, (c) not monitored and estimated by some other method, or (d) not monitored and estimated to be zero. [For those Petroleum Refineries using a "common pipe" calculation method for GHGs based on the fuel gas system configuration, the following approach shall be used in the calculation method:](#)
- [2.1 Identify the total GHG emissions associated with the common pipe sources.](#)
- [2.2 Identify in the summary all common pipe sources.](#)
- [2.3 Prorate the total GHG emissions to each source based on that source's actual fuel consumed.](#)
- [2.4 The calculation will conclude and be deemed sufficient when 95% or more of the total GHG emissions associated with the common pipe sources are allocated.](#)
- 401.3** A detailed listing of the annual emissions of each criteria pollutant, TAC, and GHG emitted from each source at the Petroleum Refinery or Support Facility, and a complete description of the methodology used for monitoring and determining these emissions, any changes made, and including documentation of the basis for any assumptions used. Any methodologies that are unchanged from a previously submitted Annual Emissions Inventory under this section may instead be noted as such. Emissions resulting from accidental releases and flaring events addressed in Regulation 12, Rules 11 and 12 shall be identified, included and quantified as such, along with the

date(s) and time(s) that the release occurred.

- 401.4** Beginning with the Annual Emissions Inventory for the calendar year 2017 (due on or before June 30, 2018), and for every subsequent calendar year Annual Emissions Inventory, a table that shows, on a Petroleum Refinery-wide or Support Facility-wide basis for each applicable air pollutant, the change in emissions that occurred between the current and most recent previous Annual Emissions Inventory. Emission changes do not need to be shown for any newly-listed air pollutants in the current Annual Emissions Inventory.

12-15-402 Review and Approval of Annual Emissions Inventory: The procedure for determining whether an Annual Emissions Inventory meets the requirements of this rule is as follows:

- 402.1 Preliminary Review:** Within 45 days of receipt of the report, the APCO will complete a preliminary review of the report to identify any deficiencies that need to be corrected. If the APCO determines that the submitted report ~~is deficient~~does not meet the requirements of Rule 12-15, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination and the required corrective action. The APCO shall provide the owner/operator with the opportunity to meet and confer to discuss any objections to the APCO's preliminary determinations before they become final. If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the report, the Preliminary Review shall be deemed complete.

- 402.2 Corrective Action:** Upon receipt of such notification, the owner/operator shall correct the identified deficiencies and resubmit the report within 45 days. If the APCO determines that the owner/operator failed to correct any deficiency identified in the notification, the APCO will disapprove the report, or the APCO may make the necessary corrections to the emissions inventory report with a designation that the report includes Air District revisions.

- 402.3 APCO Action:** Within 45 days of the completion of preliminary review, or of resubmittal of a corrected report, the APCO will approve the report if the APCO determines that the report meets the requirements of ~~this rule~~Rule 12-15, and shall provide written notification to the owner/operator. This period may be extended by 45 days if necessary as determined by the APCO, and such extension will be communicated to the applicable refinery prior to the completion of the 45-day period. If the APCO determines that the report does not meet the requirements of ~~this rule~~Rule 12-15, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination. Upon receipt of such notification, the owner/operator shall correct the identified deficiencies and resubmit the report within 45 days. If the APCO determines that the owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the owner/operator has failed to meet the requirements of this rule, and will disapprove the report, or the APCO may make the necessary corrections and approve the report with a designation that the report was approved with Air District revisions. If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the corrected report, the Annual Emissions Inventory shall be deemed complete.

- 402.4 Public Inspection:** Within 15 days of the approval or disapproval of a report under Section 12-15-402.3, the APCO shall post the approved or disapproved report on the Air District's website. The Air District shall consider any written comments submitted by the public or regulated community regarding this report and will make any corrections needed to ensure accuracy and completeness of the report. The public versions of these reports will not include detailed calculation methodologies for individual sources, but a short methodological description will be provided. In addition, the public versions of these reports will provide aggregated, rather than source specific emissions information for GHG.

12-15-403 Air Monitoring Plans: A Petroleum Refinery owner/operator, but not a Support Facility owner/operator, shall obtain and maintain APCO approval of a plan for establishing and operating a fence-line monitoring system. Timely submittal as described in the next sentence shall constitute compliance with this requirement unless and until there is a determination of

disapproval by the APCO pursuant to Section 404. On or before April 20, 2017, the owner/operator shall submit to the APCO a [site-specific](#) plan for establishing and operating a fence-line monitoring system to aid in determining specified pollutants that cross the refinery fence-line(s) in real-time. The plan shall include detailed information describing the equipment to be used to monitor, record, and report air pollutant levels, the siting, operation, and maintenance of this equipment, and procedures for implementing data quality assurance and quality control. [The District will allow for a tailored implementation date for each Petroleum Refinery's initial site-specific plan. Tailored implementation dates may be affected by factors beyond the refinery's control, including timing considerations for the design, permitting, sourcing, installation, testing, and start-up of fence-line monitoring systems, and other potential delays that are explained and supported in the site-specific plan.](#) Within one year of approval by the District Board of Directors of updated air monitoring guidelines published by the APCO under Section 12-15-406, the refinery owner/operator shall submit to the APCO an updated [site-specific](#) air monitoring plan. [The District will allow for a tailored implementation date for each Petroleum Refinery's updated site-specific air monitoring plan.](#)

12-15-404 Review and Approval of Air Monitoring Plans: The procedure for determining whether an air monitoring plan submitted under Section 12-15-403 meets the applicable requirements of this rule is as follows:

- 404.1 Preliminary Review:** Within 45 days of receipt of the air monitoring plan, the APCO will complete a preliminary review of the plan to identify any deficiencies that need to be corrected. If the APCO determines that the submitted plan is deficient, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination and the required corrective action. [If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the air monitoring plan, the Preliminary Review shall be deemed complete.](#)
- 404.2 Corrective Action:** Upon receipt of such notification, the owner/operator shall correct the plan and resubmit the proposed plan within 45 days. If the APCO determines that the owner/operator failed to correct any deficiency identified in the notification, the APCO will disapprove the plan.
- 404.3 Public Comment:** The plan, including any revisions made to correct deficiencies, will be made available for public review within 45 days (with the exception of information designated confidential). The APCO will consider any written comments received during this period prior to approving or disapproving the final plan.
- 404.4 Final Action:** Within 45 days of the close of the public comment period under Section 12-15-404.3, the APCO will approve the air monitoring plan if the APCO determines that the plan meets the requirements of Section 12-15-403, and shall provide written notification to the owner/operator. This period may be extended [by 45 days](#) if necessary as determined by the APCO. If the APCO determines that the plan does not meet the requirements of Section 12-15-403, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination. Upon receipt of such notification, the owner/operator shall correct the identified deficiencies and resubmit the air monitoring plan within 45 days. If the APCO determines that the owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the owner/operator has failed to meet the requirements of Sections 12-15-403 and will disapprove the plan. [If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the corrected air monitoring plan, the air monitoring plan shall be deemed complete.](#)
- 404.5 Public Inspection:** Within 15 days of the approval or disapproval of an air monitoring plan under Section 12-15-404.4, the APCO shall post the plan on the Air District's website, and shall notify any member of the public who submitted comments under Section 12-15-404.3, or who otherwise has requested such notification of this action in writing. In making information available for public inspection, the confidentiality of trade secrets, as designated by the owner/operator, shall be handled in accordance with Section 6254.7 of the Government Code.

- 12-15-405 Emissions Inventory Guidelines:** The APCO shall publish, and periodically update, emissions inventory guidelines describing best practices to be used when calculating emissions required to be reported in accordance with Rule 12-15~~producing emissions inventories required under this rule~~. Emission factors and emission estimation methodologies included in these guidelines may include, but are not limited to, continuous monitoring to measure emissions, applying the results of emissions source tests to known activity levels, combining published emission factors with known activity levels, material balances, or empirical formulae. The District shall request comments from affected facilities at least 60 days in advance of making changes to the Emissions Inventory Guidelines. The District shall respond to comments received. Affected facilities shall be allowed at least 90 days to implement the changes in the Emissions Inventory Guidelines. The District will use these guidelines as criteria to determine whether a ~~for review of~~ Petroleum Refinery and Support Facility emissions inventory meets the requirements of ~~submittals~~ Rule 12-15.
- 12-15-406 Air Monitoring Guidelines:** The APCO shall publish air monitoring guidelines for Petroleum Refineries that describe the factors that the District will apply in reviewing fence-line monitoring systems required under this rule. These guidelines may include, but are not limited to, specifications for pollutant coverage, siting, instrumentation, operation, maintenance, quality assurance, quality control, and data reporting. The guidelines shall be reviewed by the APCO within five years of initial issuance in consideration of advances in air monitoring technology, updated information regarding the health effects of air pollutants, and review of data collected by existing fence-line air monitoring systems established under this rule. The District shall request comments from affected facilities at least 60 days in advance of making changes to the Air Monitoring Guidelines. The District shall respond to comments received.
- 12-15-407 Designation of Confidential Information:** Except as stated in Sections 12-15-209 and 12-15-408, w~~When submitting~~providing any documents or records required by this rule to the District, the Petroleum Refinery or Support Facility owner/operator shall designate as confidential any information claimed to be exempt from public disclosure under the California Public Records Act, Government Code Section 6250 et seq. ~~If a document is submitted that contains information designated confidential in accordance with this section, the owner/operator shall provide a justification for this designation and shall submit a separate copy of the document with the information designated confidential redacted.~~
- 12-15-408 Availability of Monthly Crude Slate Reports:** A Petroleum Refinery owner/operator, but not a Support Facility owner/operator, shall make available to the APCO, upon request, in an APCO-approved format, the following information:
- 408.1 Historical Monthly Crude Slate Reports:** For each month of the years 2013, 2014, 2015 and 2016, summarized information as described in Table 1, to the extent ~~such~~this information is available based on the records maintained in the normal course of business. Detailed supporting data, based on records maintained by the Petroleum Refinery in the normal course of business, shall be made available at the Petroleum Refinery upon APCO request for verification of the monthly summaries described in Section 12-15-209, effective April 20, 2017. To ensure the protection of Confidential Information and prevent its inadvertent release, the District will not remove or make copies of the detailed supporting data. The District shall use the supporting data only to verify the monthly cumulative statistical analysis of the summarized information found in Table 1. Any notes the District creates based on review of the supporting data will not depict the supporting data in any form or manner such that a third party could deduce or reconstruct the supporting data (sometimes colloquially referred to as "reverse-engineering"). If the District finds a discrepancy between the monthly reports and supporting data, the District shall allow the Petroleum Refinery a reasonable opportunity to correct the discrepancy. If the discrepancy is not corrected, the District may use its notes and previous notification to correct the discrepancy (which are and shall be treated as confidential) as needed to document non-compliance with this Rule. The District will treat its notes and information it generates as Confidential Information unless and until the source of the information affirmatively and in writing indicates to the District that the information contained in the notes is no longer Confidential Information (or a court of competent jurisdiction issues a final judgment ordering

[release of the information](#)).

408.2 Ongoing Monthly Crude Slate Reports: Beginning with January 2017, summarized information as described in Table 1. Detailed supporting data, [based on records maintained by the Petroleum Refinery](#) shall be made available [at the Petroleum Refinery](#) upon APCO request for verification of the monthly summaries, no later than 30 days after the end of each calendar month. [To ensure the protection of Confidential Information, the District will not remove the data from the Refinery or make any type of copies of the source information. Any information the District generates and takes possession of during its review of this detailed supporting data will not depict the supporting data in any form or manner such that a third party could deduce or reconstruct the supporting data \(sometimes colloquially referred to as "reverse-engineering"\). The District will treat any such information that it generates as Confidential Information unless and until the source of the information indicates otherwise.](#)

Table 1- Summarized Information Required in Monthly Crude Slate Report
<p>Processed Volume (thousand barrels)</p> <p>a. Total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Total volume of non-crude oil feedstocks / feedstock blends fed to all other process units.</p>
<p>API gravity (degrees)</p> <p>a. Average API gravity of total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Average API gravity of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units as defined in Section 12-15-209.</p>
<p>Sulfur content (weight percent)</p> <p>a. Average sulfur content of total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Average sulfur content of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units as defined in Section 12-15-209.</p>
<p>Vapor pressure (psia)</p> <p>a. Average vapor pressure of total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Average vapor pressure of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units.</p>
<p>BTEX (benzene, toluene, ethylbenzene, and xylene content in volume percent)</p> <p>a. Average BTEX of total volume of crude oils / crude oil blends fed to all crude units.</p> <p>b. Average BTEX of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units.</p>
<p>Metals (iron, nickel and vanadium content in ppmw)</p> <p>a. Average metals content of total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Average metals content of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units as defined in Section 12-15-209.</p>

12-15-500 MONITORING AND RECORDS

12-15-501 Fence-line Monitoring System: ~~Within one year of the approval of an air monitoring plan under Section 12-15-404,~~Once the fence-line monitoring system is installed and operational pursuant to Section 12-15-403, the Petroleum Refinery owner/operator will ensure that ~~a~~the fence-line monitoring system ~~is installed, and~~ is operated in accordance with the approved air monitoring plan. Fence-line monitoring system data shall also be reported as specified in the approved plan.

12-15-502 Recordkeeping: The Petroleum Refinery or Support Facility owner/operator shall maintain records of all information required under this rule. Such records shall be maintained for a period of five years after the date of the records, and shall be made available to the APCO upon request.

Bay Area Air Quality Management District

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Refinery Rules

Proposed Rule Amendments to:

Rule 6-5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units

Rule 11-10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers

Rule 12-15: Petroleum Refining Emissions Tracking



**FINAL STAFF REPORT
December 2018**

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APPENDIX A: Enforcement Agreement and Agreement to Stay Litigation, March 24, 2017, re: Valero, et al. v. Bay Area Air Quality Management District, case number N16-0095 (Valero Case Agreement)

APPENDIX B: Settlement, Enforcement, and Release Agreement, March 1, 2018, re: WSPA, et al. v. Bay Area Air Quality Management District, case number N16-0963 (WSPA Case Agreement)

APPENDIX C: Cooling Tower Hydrocarbon Emissions Estimates

APPENDIX D: Summary of Comments and Responses on Proposed Amendments to Rules 6-5, 11-10, and 12-15 and Staff Report

I. EXECUTIVE SUMMARY

The Bay Area Air Quality Management District (Air District) is proposing amendments to two of three rules that were adopted by the Air District Board of Directors on December 16, 2015. These rules were challenged by three of the five Bay Area refineries in a lawsuit that was filed on January 22, 2016, *Valero, et al. v. Bay Area Air Quality Management District*, case number N16-0095, and amended on February 16, 2016. On March 24, 2017 the parties to the lawsuit entered an enforcement agreement and agreement to stay litigation for all three of these regulations (referred to in this Report as the “Valero Case Agreement”). Terms of the Agreement affect implementation of Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (Rule 6-5); Regulation 8, Rule 18: Equipment Leaks (Rule 8-18); and Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers (Rule 11-10). This Report will sometimes use the phrase “2016 Refinery Rules” when referring to these three rules collectively. Specifically, the Air District staff committed in the Agreement to implement the three rules that were challenged for a limited period of time in a manner consistent with how the rules are being proposed to change. The intent of this provision is that the refineries should not have to implement in the near-term provisions that are different than those contemplated in the Agreement. If the rules are not changed as contemplated in the Valero Case Agreement, the refineries will have to implement the rules as originally adopted in 2016. In that scenario, the refineries could reactivate their lawsuit and move forward with their legal challenge to the rules.

The Agreement states the Air District will propose amendments to the 2016 Refinery Rules for adoption by the Air District Board of Directors by November 1, 2018. This Staff Report describes the draft amendments to Rule 6-5 and to Rule 11-10 and provides the background information and rationale for the proposed amendments. Draft amendments to Rule 8-18 are not being presented at this time and will be delayed until a Refinery Heavy Liquids Fugitive Leaks study can be completed at all five Bay Area refineries. This study is underway, and findings are expected to be finalized in late 2018. Information from the study will be used to determine appropriate amendments for Rule 8-18, expected in Spring 2019.

In addition, the Air District is proposing amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (Rule 12-15), adopted by the Air District Board of Directors on April 20, 2016. Rule 12-15 was challenged in a lawsuit that was filed by the Western States Petroleum Association (“WSPA”) and three of the refineries on May 25, 2016, *WSPA, et al. v. Bay Area Air Quality Management District*, case number N16-0963. Like the Valero Case Agreement, parties to the lawsuit have entered an agreement to stay the WSPA case litigation contingent on the Air District proposing specified amendments to Rule 12-15 (but not Rule 9-14). This agreement, entered into as of March 1, 2018, will be referred to in this Report as the “WSPA Case Agreement.” Similar to the Valero Case Agreement, in the WSPA Case Agreement the Air District committed to implement Rule 12-15 for a limited period of time in a manner consistent with how Rule 12-15 is being proposed as contemplated in the Agreement. The intent of this provision is that the refineries should not have to implement in the near-term provisions that are different than those contemplated in the Agreement. If Rule 12-15 is not changed as contemplated in the Agreement, the refineries will have to implement Rule 12-15 as originally adopted. In that

scenario, the refineries could reactivate their lawsuit and move forward with their legal challenge to Rule 12-15. This staff report describes the proposed amendments to Rule 12-15 and provides the background information and rationale for the proposal.

The proposed amendments to Rule 6-5 include revisions to:

- Clarify exemptions and rule provisions.

The proposed amendments to Rule 11-10 include revisions to:

- Modify and clarify limited exemptions for smaller cooling towers;
- Clarify a limited exemption for cooling towers not in petroleum refining service;
- Modify and clarify leak monitoring, action, and reporting requirements; and
- Remove Best Modern Practices requirements and associated reporting requirements.

The proposed amendments to Rule 12-15 include revisions to:

- Modify and clarify rule definitions and applicability;
- Clarify the annual Emissions Inventory review and approval process;
- Modify and clarify fence-line monitoring plan requirements, and review and approval process;
- Modify the process for updating Emissions Inventory Guidelines and Air Monitoring Guidelines;
- Modify the monthly crude slate report requirements; and
- Modify provisions for designating confidential information.

The Air District is publishing the full mark-up text of proposed amendments for Rule 6-5, Rule 11-10, and Rule 12-15 along with this Staff Report.

The proposed amendments to Rule 6-5 would apply to the four Bay Area refineries with fluidized catalytic cracking units. The proposed amendments to Rule 11-10 and Rule 12-15 would apply to all five Bay Area refineries.

Proposed amendments to Rule 6-5 would have no impact on emissions, as the amendments are clarifications of the original intent of Rule 6-5. Similarly, proposed amendments to Rule 12-15 have no impact on emissions. Rule 12-15 is an emissions reporting rule, therefore affect only emissions reporting and no controls are required.

Cooling tower hydrocarbon emission estimates are shown in Appendix C. Baseline emissions are prior to December 2015. Rule 11-10, as adopted in December 2015, was never implemented. Instead, Rule 11-10 has been implemented under the terms of the Valero Case Agreement. Proposed amendments to Rule 11-10 have been developed to formalize the terms of the Valero Case Agreement. It should be noted, however, that the proposed amendments could theoretically impact emissions relative to the rule, as adopted. This possible difference is due to reduced frequency in monitoring and thus potential delay in identifying and repairing a leak. As shown in Appendix C, staff estimates that foregone emissions reductions could be between 1 to 16 tons of hydrocarbons per year from monitoring weekly rather than daily. These potential emission impacts are described in Section VI. Emission Reduction Benefits & Compliance Costs. Furthermore, a Draft Environmental Impact Report (DEIR) was developed to analyze the potential environmental impacts. In addition, refinery fence-line monitoring (required under Rule

12-15) will be in place to detect and minimize any impacts of significant hydrocarbon leaks.

No costs would be incurred from any of the proposed amendments to these three rules. The proposed amendments to Rule 11-10 will result in cost savings from reduced frequency of cooling water monitoring.

This Staff Report describes the proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15. Following this introduction and summary, Section II, Background; Section III, Regulatory Framework; and Section IV, Technical Review each reference the relevant material available in the original Staff Reports for each rule development project in 2015 and 2016. These previous Staff Reports are attached to this staff report as Attachments 1, and 2. Section V, Proposed Rule Amendments comprehensively discusses each of the proposed rule amendments. Section VI, Emission Reductions & Compliance Costs discusses of the expected air quality impacts and compliance costs. Section VII, Rule Development and Public Consultation Process outlines the public outreach and involvement process that the Air District takes in developing the proposed amendments and provides further information on how interested members of the public can get involved.

In the process of negotiating the Valero Case Agreement and the WSPA Case Agreement, the Air District agreed to propose changes it believed were justified as a matter of policy. Notwithstanding the commitment made in these agreements to propose certain specified rule changes, the Air District is still at this point able to decide which of these changes should be adopted. Public input will be considered in making this decision. As noted above, the Valero and WSPA case agreements give the refineries the right to reactivate their lawsuits if rule changes consistent with those specified in the agreements are not adopted. Notwithstanding these legal consequences, the Air District's intent in seeking comment on these proposed amendments is to follow through with adoption after considering all comments received.

An analysis of the potential environmental impacts of the proposed amendments to the Rules 6-5, 11-10, and 12-15 was conducted pursuant to the California Environmental Quality Act (CEQA). The Environmental Impact Report concluded that the proposed amendments to Rule 11-10 could result in foregone ROG emission reductions compared to the existing Rule 11-10 (as previously adopted, but not implemented) that could exceed the operational ROG significance thresholds. Therefore, air quality impacts from the proposed amendments to Rule 11-10 were found to be potentially significant.

Air District staff recommends adoption of proposed amendments Rule 6-5, Rule 11-10, and Rule 12-15 and certification of the CEQA Final Environmental Impact Report.

II. BACKGROUND

Background information for each of the rule development projects for Rule 6-5, Rule 11-10, and Rule 12-15 are available in the Background sections of each staff report, attached as Attachment 1 (Rule 6-5 and Rule 11-10 Staff Report) and Attachment 2 (Rule 12-15 Staff Report).

III. REGULATORY FRAMEWORK

Information on the regulatory context and framework pertinent to sources and facilities subject to Rule 6-5, Rule 11-10, and Rule 12-15 can be found in the attached staff reports for these rules.

IV. TECHNICAL REVIEW

Technical information on the facilities, sources, and emissions subject to Rule 6-5, Rule 11-10, and Rule 12-15 can be found in the attached staff reports for these rules.

V. PROPOSED RULE AMENDMENTS

This section discusses the proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15 in detail.

A. Proposed Amendments to Rule 6-5

The proposed amendments to Rule 6-5 include revisions to provide more clarity and conciseness to portions of the Rule, as described below.

Clarification of Rule Provisions

Section 6-5-111: Exemption, Emissions Abated by Wet Scrubber: This exemption is clarified by stating more clearly that the requirements of the rule do not apply to sources abated with a wet scrubber that constitutes best available control technology (BACT). Because a wet scrubber is the most stringent control available for controlling particulate from a fluidized catalytic cracking unit, this rule would have no potential impact on a refinery using a wet scrubber. The change in rule language is consistent with the intent of the rule as adopted and does not represent a substantive change.

Section 6-5-301: Fluidized Catalytic Cracking Unit (FCCU) Emission Limits: This section is made more succinct by deleting placeholders for future limits on condensable particulate matter and sulfur dioxide (SO₂). Limits on these emissions may be developed at a future date, but are not being proposed now. This is not a substantive change. The placeholder limits are informational only, and were included in the rule to alert readers to the intended two-part nature of Rule 6-5, in which the 2015 rule adoption, focusing on ammonia injection optimization, was to be followed by examination and possible adoption of further control measures. The Air District believes that interested parties are sufficiently aware of the two-part plan that the placeholder is no longer needed to serve the informational purpose for which it was intended, and can be deleted from the rule. Deleting the placeholders will have no effect on the Air District's authority to adopt further measures to control particulate from refinery FCCUs.

B. Proposed Amendments to Rule 11-10

The proposed amendments to Rule 11-10 include revisions to modify limited exemption requirements; modify and clarify leak monitoring, action, and reporting requirements; and remove modern practice requirements and reporting, as described below.

Limited Exemptions for Smaller Cooling Towers

Section 11-10-105: Limited Exemption, Recirculation Rates Less Than 500 Gallons Per Minute: This limited exemption is amended to require cooling towers with a water recirculation rate of less than 500 gpm to be monitored once every week (rather than every 14 days). The proposed amendments also allow operators to elect to move to a monthly monitoring schedule if monitoring results at the cooling tower are below the Leak Action Level for four consecutive weeks. If the Leak Action Level is exceeded, the operator must revert to the weekly monitoring schedule, but may be eligible to again move to the monthly monitoring schedule after demonstrating four consecutive weeks below the Leak Action Level.

Section 11-10-106: Limited Exemption, Recirculation Rates Less Than 2,500 Gallons Per Minute: This limited exemption is amended to require cooling towers with a water recirculation rate of less than 2,500 gpm to be monitored once every week (rather than every seven days). The amendments also allow operators to elect to move to a monthly monitoring schedule if monitoring results at the cooling tower are below the Leak Action Level for four consecutive weeks. If the Leak Action Level is exceeded, the operator must revert to the weekly monitoring schedule, but may be eligible to again move to the monthly monitoring schedule after demonstrating four consecutive weeks below the Leak Action Level.

The proposed amendments to Sections 11-10-105 and 11-10-106 standardize the monitoring requirements for cooling towers under these limited exemptions, providing identical requirements for all cooling towers with water recirculation rates in both of these size ranges. The amended weekly monitoring schedule is more frequent than the existing rule requirement for cooling towers with rates less than 500 gpm (once every 14 days) and is of similar frequency to the existing requirement for cooling towers with rates less than 2,500 gpm (once every seven days). The Air District believes the provision under both sections to allow operators to move to monthly sampling is a more rational approach that tailors monitoring frequency to be more or less intensive depending on the past monitoring results. This will reduce monitoring burden for well-performing units while maintain a stricter monitoring regime for units with heat exchangers showing a tendency to leak.

Limited Exemption for Cooling Towers Not in Petroleum Refining Service

Section 11-10-107: Limited Exemption, Cooling Towers Servicing Hydrogen Production, Carbon Dioxide Recovery and Power Generation Facilities: This exemption is amended to clarify that cooling towers that are not in petroleum refining services are exempt from the total hydrocarbon requirements of this rule. Specific examples of cooling towers not in petroleum refining service are cited. Provisions are made to clarify that cooling towers serving refinery sulfur plants, lube oil streams, and amine streams will be evaluated on a case-by-case basis to determine if the cooling tower is subject to the total hydrocarbon requirements of the Rule. This is a clarification of original intent and not a substantive change.

Leak Monitoring, Action, and Reporting Requirements

Section 11-10-304: Total Hydrocarbon Leak Monitoring Requirement: Subsection 304.1 is amended to require cooling towers to be sampled once every week (rather than once

every day). The proposed amendments also allow operators to elect to move to a twice-monthly (two samples per month) sampling schedule if sampling results at the cooling tower are below the Leak Action Level for six consecutive months (26 consecutive weekly samples). If the Leak Action Level is exceeded, the operator must revert to the weekly sampling schedule, but may be eligible to again move to the twice-monthly sampling schedule after demonstrating six consecutive months below the Leak Action Level. Section 11-10-304.3 is also amended to require operators using an alternative Air District approved monitoring method to follow these same monitoring frequency requirements described in Section 11-10-304.1.

The amended weekly monitoring schedule is less frequent than the existing requirement (once every day) and is identical to the weekly frequency required of smaller cooling towers under the amended Sections 11-10-105 and 11-10-106. After further examination and consultation with the refineries following adoption of Rule 11-10, the Air District concluded that daily monitoring is more burdensome than necessary. Cooling tower leaks have the potential to emit a large amount of emissions, but they are a rare occurrence. The Air District believes weekly rather than daily monitoring better balances the burden of monitoring with the potential for excess emissions and is still a substantial improvement over pre-existing practices. The provision to allow operators to move to twice-monthly sampling is a more rational approach that tailors monitoring frequency to be more or less intensive depending on the past monitoring results. Again, this will reduce monitoring burden for well-performing units while maintain a stricter monitoring regime for units with heat exchangers showing a tendency to leak.

The proposed amendments to monitoring frequency may potentially delay the detection of a leak relative to Rule 11-10 as adopted. It is theoretically possible that this change in monitoring frequency would allow a cooling tower leak to go undetected for a few more days than would be allowed under the adopted version of the rule. Estimates of foregone leak emissions reductions from potential delays in detection shown in Appendix C may be speculative due to the variable nature of leaks; nevertheless, potential emissions scenarios are evaluated further in Section VI of this report. In addition, refinery fence-line monitoring will be in place to detect and help to minimize any impacts of significant hydrocarbon leaks.

Section 11-10-305: Leak Action Requirement: This section is amended to require cooling tower hydrocarbon leaks to be minimized as soon as practicable or within seven calendar days (rather than five calendar days) to provide time for necessary leak minimization delays associated with potential technical and/or safety constraints. The proposed amendment adds a provision that any delays in leak repair beyond 21 days must meet the criteria cited in 40 CFR 63.654(f)-(g) of the United States Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart CC for Petroleum Refineries and be approved by the Air District. This proposed amendment is intended to better align leak repair requirements with applicable NESHAP conditions and provide time to identify the source of the leak, and for repair delays associated with potential technical and/or safety constraints. These proposed amendments to provide additional time for leak identification, minimization and repair may potentially allow increased emissions from leaks relative to Rule 11-10 as adopted; however, the Rule still requires that remedial actions be taken as soon as practicable, and any foregone leak emissions reductions from potential delays in minimization and/or repair would be highly

speculative and are not likely to be substantial.

The section is also amended to require operators to speciate and quantify toxic air contaminants (TACs) from water sampling within 72 hours of leak discovery (rather than within one calendar day of leak discovery) to provide adequate time and flexibility for potential sampling and analysis constraints (e.g. analytical lab closed over a holiday weekend).

Section 11-10-401: Petroleum Refinery Cooling Tower Reporting Requirements: This proposed amendment clarifies that sampling of the cooling tower water must occur as soon as feasible, and no later than 24 hours from the discovery of the leak. This section is amended to require notification of the Air District of total hydrocarbon concentration and chlorine concentration within 72 hours (rather than one calendar day) of discovering the leak. The proposed amendment also removes the requirements to report lists of all heat exchangers served by the cooling tower, as well as the pH level and iron concentration of the cooling water, as this reporting is unlikely to provide additional substantive information regarding the hydrocarbon emissions from the cooling tower. Notification requirements are also being added for delays in repair that meet the criteria cited in 40 CFR 63.654(f)-(g), as referenced in amended Section 11-10-305.

Best Modern Practices Requirements and Reporting

Section 11-10-402: Best Modern Practices: This section is being deleted to avoid potential duplication and conflicts with process safety management requirements. These requirements were intended to backup hydrocarbon sampling, but facility monitoring of chlorine residual is a better backup method. In addition, maintaining these requirements in Rule 11-10 would require revisions to the rule as “best modern practices” changed, without any clear benefit since these best practices are largely drawn from other regulatory requirements such as those implemented by California Occupational Safety and Health Administration. Moreover, several practices listed relate to cooling tower water chemistry and do not relate directly to hydrocarbon emissions; practices relevant to hydrocarbon emission monitoring and leak minimization and repair are more appropriately addressed through the leak monitoring requirements, monitoring chlorine residual and leak action requirements contained in other sections of the Rule.

Section 11-10-504: Operating Records: This section is being amended to remove recordkeeping requirements associated with the deleted Section 11-10-402, as these recordkeeping requirements are no longer applicable.

C. Proposed Amendments to Rule 12-15

The proposed amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan requirements, procedures for updating guidelines, crude slate reporting requirements, and confidential information designation procedures, as described below.

Rule Definitions and Applicability

Section 12-15-205: Crude Oil: This definition is being amended to provide clarity, and language is also being added to define Crude Oil Blends for the purposes of the Rule. This does not represent a change from the intent of adopted Rule 12-15.

Section 12-15-206: Emissions Inventory: The proposed amendment removes the requirement to include emissions from cargo carriers (ships and trains) in the emissions inventory data; these cargo carriers are not under the control or authority of the refineries, and therefore the refineries are not able to validate or report cargo carrier emissions. The Air District will estimate cargo carrier emissions based on publicly-available information. Other proposed changes to this section are to clarify the original intent of the rule and do not represent substantive changes.

Section 12-15-209: Monthly Crude Slate Report: This definition is being amended to address concerns from the refineries regarding the burden of providing information on non-crude feedstocks. Non-crude feedstocks are introduced at refineries across a vast spectrum of uses and often in very small quantities. The refineries have asserted, and the Air District agrees, that there are rapidly diminishing returns in requiring the refineries to provide information on every non-crude feedstock introduced. The basic purpose of the Crude Slate Report is to investigate whether there is a relationship between varieties of processed crudes and emissions. The Air District's original intent in requiring information on non-crude feedstocks in Rule 12-15 was to address a situation in which these feedstocks are being used as a substitute for normal crude oil inputs for a substantial period of time. The proposed amendments implement this intent more effectively than the current rule by establishing a threshold below which non-crude feedstocks need not be addressed in the crude slate report.

The proposed amendments to Section 12-15-209 would establish threshold volumes for imported feedstocks with API Gravity greater than or equal to 15 degrees (°) and imported feedstocks with API Gravity less than 15° that are fed to a fluid catalytic cracking unit. For calendar months when imports exceed either of these threshold volumes, a summary report of API gravity and sulfur, iron, nickel, and vanadium content is required. Volumes of non-crude oil feedstocks below these levels are unlikely to have substantial impacts on emissions. The proposed amendments also contain a provision for the Air District to review the necessity for these reporting requirements for non-crude oil feedstock by March 1, 2023 based on information gathered. At that time, an affected refinery may also request that this non-crude oil feedstock reporting requirement for the facility be terminated based on the previous five years of reporting data. The Air District has sole discretion to grant or deny the request.

The proposed amendments would also define precautions and procedures for handling confidential data for inspection, audit, and review. The proposed amendments ensure that refinery crude slate and non-crude feedstock data are protected appropriately, remain on-site at the refinery and are prevented from inadvertent release. The Air District will audit the raw data and calculations summarizing the crude slate and non-crude feedstock data, but will take only summary information. The refineries have repeatedly asserted that keeping crude slate data confidential is essential to maintaining competitiveness in the industry. The Air District recognizes the plausibility of this assertion, and also notes that

the Crude Slate Report is part of an investigative process focused farther “upstream” from actual emissions than is typical for an air regulatory program. Given these circumstances, the Air District believes it is appropriate to build added protections into the rule to prevent the release of confidential information.

Emission Factors and Calculation Methodology

Section 12-15-401: Annual Emissions Inventory: This section is being amended to clarify the calculation methodology to be used for calculating greenhouse gases using a “common pipe” method. The proposed amendment lists the steps required to properly account for GHG emissions using fuel gas from common refinery fuel gas systems.

Note that there is a stipulation in the WSPA Case Agreement to use emission factors for heavy liquid components, as provided in the California Air Pollution Control Officers Association (CAPCOA) California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities,¹ on an interim basis. This section of the rule language is not being amended to include these emission factors for refinery heavy liquid fugitive leaks because this information fits best in the Air District Refinery Emissions Inventory Guidelines. These emission factors are considered interim and will be used until the Air District has completed the Refinery Heavy Liquids Study² and has developed new Bay Area refinery emission factors for these components.

Annual Emissions Inventory Review and Approval Process

Section 12-15-402: Review and Approval of Annual Emissions Inventory: This section is being amended to clarify the process for communicating and issuing preliminary review determinations under Section 12-15-402.1. The proposed amendment also clarifies the notification process for Air District of the review period under Section 12-15-402.3 and sets a limit of 45 days for the extension of the review period.

Fence-line Monitoring Plan Requirements and Review Process

Section 12-15-403: Air Monitoring Plans: This section is being amended to clarify that site-specific air monitoring plans will be allowed to have implementation schedules and dates that are tailored to the specific plan. The proposed amendments reflect that each refinery faces a unique set of circumstances in implementing a fence-line monitoring system. The intent of this proposed amendment is to allow facilities adequate time to properly complete design, permitting, sourcing, installation, testing, and start-up of monitoring systems, and to account for potential delays that are beyond the refinery’s control, provided that these timing considerations are explained and supported in the plan. This provision for a tailored implementation date will also be applicable to the updates of the site-specific plans that will be required after updated air monitoring guidelines are published by the Air District, as described in Section 12-15-406.

¹ Emission Factors from TABLE IV-3a: CAPCOA-Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals, California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon leaks at Petroleum Facilities, CAPCOA, February 1999.

² The Air District is currently conducting a study of fugitive leaks from heavy liquid components at the Bay Area refineries.

Section 12-15-404: Review and Approval of Air Monitoring Plans: This section is being amended to clarify the process for issuing preliminary review determinations under Section 12-15-404.1. The proposed amendment also clarifies notification process for extension of the Air District's review period under Section 12-15-404.4 and sets a limit of 45 days for the extension of the review period.

Section 12-15-501: Fence-line Monitoring System: These proposed amendments clarify that the requirements of this section are effective once the fence-line monitoring system is installed and operational, replacing the existing effective date of one year after approval of the air monitoring plan. This reflects the proposed amendment in Section 12-15-403 to allow tailored implementation dates for each site-specific air monitoring plan.

Update of Emissions Inventory Guidelines and Air Monitoring Guidelines

Section 12-15-405: Emissions Inventory Guidelines: Proposed amendments to the guideline update process include a 60-day comment period for affected facilities to review and comment on changes to the Emissions Inventory Guidelines; and the Air District must respond to comments received. Affected facilities will be given at least 90 days to implement changes from the updated Emissions Inventory Guidelines in their respective annual emissions inventories. These proposed amendments are intended to provide affected facilities the opportunity to provide relevant feedback to proposed guideline changes and allow sufficient time for these changes to be promulgated.

Section 12-15-406: Air Monitoring Guidelines: Proposed amendments to the guideline update process include a 60-day comment period for affected facilities to review and comment on changes to the Air Monitoring Guidelines; and the Air District shall respond to comments received. This proposed amendment is intended to provide affected facilities the opportunity to provide relevant feedback to proposed guideline changes.

Monthly Crude Slate Report Requirements

Section 12-15-408: Availability of Monthly Crude Slate Reports: Section 12-15-408.1 is being amended to validate that the historical monthly crude slate data required for years 2013, 2014, 2015, and 2016 will be based on records maintained by the refinery in the normal course of business, as historical data collected during these previous years may or may not align with the frequency, method, or scope of the ongoing monthly crude slate reports required under amended Section 12-15-408.2. The proposed amendments to this provision also define precautions and procedures for handling confidential data for inspection, audit, and review. The proposed amendments ensure that refinery confidential data are protected appropriately, remain on-site at the refinery, and are prevented from inadvertent release.

Subsection 12-15-408.2 is being amended to modify the summarized information required in the monthly crude slate report. These proposed amendments are made in Table 1 of the Rule and include added references to amended Section 12-15-209 regarding non-crude oil feedstock reporting requirements, deletion of vapor pressure reporting requirements for non-crude oil feedstocks, and deletion of BTEX (benzene, toluene, ethylbenzene, and xylene) reporting requirements for crude oil and non-crude oil feedstocks. A large majority of non-crude oil feedstocks are heavy gas oils, which have very low vapor pressure. BTEX is not typically analyzed for each shipment during the normal course of business, so this

information is generally not readily available. In addition, the concern about BTEX occurs primarily with light “oil-shale” and fracking based crudes where vapor pressure is adequate to flag any significant changes.

The proposed amendments to this subsection also define precautions and procedures for handling confidential data for inspection, audit, and review. The proposed amendments ensure that refinery confidential data is protected appropriately, remains on-site at the refinery and is prevented from inadvertent release.

Designation of Confidential Information

Section 12-15-407: Designation of Confidential Information: This section is amended to defer to the amended Sections 12-15-209 and 408 for requirements regarding designation of confidential information under those sections, as those amended sections discuss treatment of confidential information explicitly. The requirements for an owner/operator to provide a redacted version of the document are removed because they are not relevant to Rule 12-15. Crude slate reports are not required to be submitted to the Air District. Emissions inventories are by definition “emissions data” and so cannot be claimed as confidential. Fence-line monitoring plans have already been submitted and contained no claims of confidentiality. It is likely that any revisions to those plans will likewise contain no confidentiality claims.

VI. EMISSION REDUCTION BENEFITS & COMPLIANCE COSTS

This section of the Staff Report summarizes the emission impacts that would result from the proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15, and the costs involved with these amendments.

A. Amendments to Rule 6-5

The proposed amendments to Rule 6-5 will have no impact on emissions. The proposed amendments are clarifications of the original intent of Rule 6-5. There are no costs associated with the amendments to Rule 6-5.

B. Amendments to Rule 11-10

Rule 11-10 has been implemented under the terms of the Valero Case Agreement. Proposed amendments to Rule 11-10 have been developed to formalize how Rule 11-10 has been implemented. Baseline emissions, and emissions reductions from enhanced cooling tower monitoring are estimated as shown in Appendix C.

The proposed amendments to Rule 11-10 would require weekly monitoring, with potential adjustments to twice-monthly monitoring (i.e. two samples per month). These proposed amendments are estimated to reduce ROG emissions to as low as 64 tpy, as described in Appendix C. While less stringent than daily monitoring, weekly monitoring remains substantially more stringent than monthly monitoring. Changing monitoring frequency as proposed in amendments to Rule 11-10 would not result in an increase in actual emissions because the amendments are consistent with how the Rule has been implemented since adoption. However, the change in monitoring frequency, when compared to the rule language as adopted, can theoretically allow for an emissions impact since less frequent

monitoring may allow a potential future leak to go undetected for a longer period of time. The Air District can, through its enforcement program, take additional samples at random to increase the frequency of monitoring at facilities. This would reduce the amount of time between rule required monitoring where there is no data at facilities and mitigate some of the foregone emission reductions.

The Air District's position is that a theoretical impact of increased emissions relative to the rule language that was never implemented does not require analysis under CEQA. However, for the sake of transparency and thoroughness, the Air District is analyzing these theoretical impacts so that the public understands the difference between the rule as it was adopted (though not implemented) and the rule as proposed. Staff estimates the foregone emissions reductions that could theoretically occur when monitoring weekly rather than daily range from 1 tpy to 16 tpy, as shown in Appendix C. A Draft Environmental Impact Report has been developed to further analyze the environmental impacts. CEQA Guidelines indicate that cumulative impacts of a Project shall be discussed when the Project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065(c). The cumulative air quality impacts of the proposed Project have been evaluated in the Draft EIR.

No costs are incurred from proposed amendments to Rule 11-10. Estimated cost savings from the proposed amendments to Rule 11-10 that reduce frequency of cooling water monitoring are based on sampling and analysis of cooling water samples weekly, rather than daily. Staff assumes no continuous monitors are installed. Table C:4c in the Rule 11-10 staff report summarizes total sampling and analysis costs at \$2,187,350 per year. Staff estimates reducing sample frequency from daily to weekly, including times when sampling frequency may be extended to twice-monthly or monthly will reduce costs by \$1,678,750 per year. Cost effectiveness of reducing sample frequency and analysis is \$110,000 saved per ton of potentially foregone emission reductions. This savings indicates these amendments are reasonable, since \$110,000 per ton is well outside the range of normal cost effectiveness determinations.

C. Amendments to Rule 12-15

The proposed amendments to Rule 12-15 would have no impact on emissions. Rule 12-15 is an emissions reporting rule, so no controls are required, and the amendments affect only emissions reporting. There are no costs associated with the amendments to Rule 12-15.

VII. REGULATORY IMPACTS

Regulatory impact information on the facilities, sources, and emissions subject to Rule 6-5, Rule 11-10, and Rule 12-15 can be found in the attached staff reports for these rules.

VIII. RULE DEVELOPMENT AND PUBLIC CONSULTATION PROCESS

A. Rule Development Process

Staff anticipates that proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15 will be considered together at a Public Hearing. The Draft Environmental Impact Report (DEIR) will consider the cumulative impact of these three rule amendments. The Socioeconomic Analysis completed for Rule 6-5 and Rule 11-10 at the time of their

adoption, and the Socioeconomic Analysis completed for Rule 12-15 at the time of its adoption are attached to this staff report. Proposed amendments to Rule 6-5 and Rule 12-15 do not have any cost impacts. Proposed amendments to Rule 11-10 will result in cost savings. Since the cost impacts of these proposed amendments are no impacts or cost savings, no additional analysis beyond what has already been reported is needed.

B. Public Outreach and Consultation

A Public Hearing is the next step in the rulemaking process. Air District staff posted the CEQA Notice of Preparation / Initial Study of environmental impacts on August 1, 2018. Air District staff conducted a CEQA Scoping Meeting on Monday, August 20, 2018 at the District office. Comments for the CEQA analysis were due by Friday, September 7, 2018. The CEQA Initial Study and comments are found in the Draft Environmental Impact Report, Appendix A. During this comment period, the Air District received a comment letter from Communities for a Better Environment (and several co-signatories) expressing concern that amendments to Rule 6-5 would preclude the Air District from requiring strict condensable PM controls on FCCUs. The Air District responded and clarified that the amendments to Rule 6-5 consists of formatting changes and a clarification of original intent, and would not preclude the Air District from considering further amendments to make the rule more stringent in the future.

Air District staff posted the draft amendments to Rule 6-5, Rule 11-10, and Rule 12-15 and initial staff report on August 20, 2018 to solicit input and identify any potential issues and concerns. Comments for the draft amendments and initial staff report were due by Friday, September 21, 2018. Air District staff considered input received and continued to conduct further analysis to prepare the proposed amendments and staff report. Staff published the staff report and proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15 on October 22, 2018 and accepted written comments through December 7, 2018. One comment letter was received during this comment period, and staff prepared a summary of comments received and responses for inclusion in the final proposal package. Staff will present final proposals to the Air District's Board of Directors for their consideration. At the Public Hearing, the Air District's Board of Directors will consider the final proposals and receive public input before taking any action on the proposed amendments.

C. Review of Potential Environmental Impacts Under CEQA

The Air District contracts with an independent consultant to conduct a California Environmental Quality Act (CEQA) analysis of potential environmental impacts from any rule making projects. A Notice of Preparation/Initial Study (NOP/IS) regarding the impact of these proposed rule amendments were posted August 1, 2018 for review and comment. The CEQA Scoping Meeting was conducted on Monday, August 20, 2018.

The DEIR was conducted for all three proposed amended rules as individual CEQA projects. The consultant made an initial assessment of any environmental impacts based on the proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15, as well as this Staff Report. The DEIR includes a cumulative impacts analysis addressing, among other things, these three rules. The cumulative impacts analysis will be updated when Rule 8-18 is proposed for revisions as anticipated in the second half of 2019.

The DEIR was posted on October 22, 2018 for review and comment, and written comments

were accepted through December 7, 2018. No comment letters on the DEIR were received during the comment period. Prior to making a decision on the adoption of the proposed amendments, the Air District's Board of Directors must review and certify the Final EIR as providing adequate information on the potential adverse environmental impacts of implementing the projects. The EIR concluded that the proposed amendments to Rule 11-10 could result in foregone ROG emission reductions compared to the existing Rule 11-10 (as adopted, but not implemented), and that these theoretical foregone emission reductions could exceed the operational ROG significance thresholds. Therefore, air quality impacts from the proposed amendments to Rule 11-10 were found to be potentially significant. No feasible mitigation measures have been identified to avoid or reduce the impacts to less than significant.

The final proposals and staff report have been used to finalize the CEQA environmental analysis. At the Public Hearing, the Air District Board of Directors will consider the final proposal and public input before taking any action on the proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15.

D. Review of Potential Socio-Economic Impacts

The Air District contracts with an independent consultant to conduct a Socioeconomic Analysis of potential economic impacts from the proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15. The Socioeconomic Analysis completed for Rule 6-5 and Rule 11-10 at the time of their adoption, and the Socioeconomic Analysis completed for Rule 12-15 at the time of its adoption are attached to this workshop report. Proposed amendments to Rule 6-5 and Rule 12-15 do not have any cost impacts. Proposed amendments to Rule 11-10 will result in cost savings. Since the cost impacts of these proposed amendments are no impacts or cost savings, no additional analysis beyond what has already been reported is needed.

IX. CONCLUSION / RECOMMENDATIONS

Pursuant to the California Health and Safety Code [section 40727](#), before adopting, amending, or repealing a rule the Board of Directors must make findings of necessity, authority, clarity, consistency, non-duplication and reference. This section addresses each of these findings.

A. Necessity

“‘Necessity’ means that a need exists for the regulation, or for its amendment or repeal, as demonstrated by the record of the rulemaking authority.” H&SC [section 40727\(b\)\(1\)](#).

Proposed amendments to Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (Rule 6-5); Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers (Rule 11-10), and Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (Rule 12-15) are needed to improve the clarity and efficiency of these rules as explained above in this Staff Report.

B. Authority

“‘Authority’ means that a provision of law or of a state or federal regulation permits or requires the regional agency to adopt, amend, or repeal the regulation. H&SC [Section 40727\(b\)\(2\)](#).”

The Air District has the authority to adopt amendments to these rules under Sections 40000, 40001, 40702, and 40725 through 40728.5 of the California Health and Safety Code.

C. Clarity

“‘Clarity’ means that the regulation is written or displayed so that its meaning can be easily understood by the persons directly affected by it.” H&SC [Section 40727\(b\)\(3\)](#)

Proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15 are written so that their meaning can be easily understood by the persons directly affected by them. Further details in the staff report clarify the proposals, affected emission sources, compliance options, and administrative requirements for the industries subject to this rule.

D. Consistency

“‘Consistency’ means that the regulation is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.” H&SC [Section 40727\(b\)\(4\)](#)

The proposed amendments to the existing rule are consistent with other Air District rules, and not in conflict with state or federal law.

E. Non-Duplication

“‘Nonduplication’ means that a regulation does not impose the same requirements as an existing state or federal regulation unless a district finds that the requirements are necessary or proper to execute the powers and duties granted to, and imposed upon, a district.” H&SC [Section 40727\(b\)\(5\)](#)

Proposed amendments to Rule 6-5, Rule 11-10, and Rule 12-15 are non-duplicative of other statutes, rules or regulations. To the extent duplication exists, such duplication is appropriate for execution of powers and duties granted to and imposed upon the Air District.

F. Reference

“‘Reference’ means the statute, court decision, or other provision of law that the district implements, interprets, or makes specific by adopting, amending, or repealing a regulation.” H&SC [Section 40727\(b\)\(6\)](#)

Implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 40000, 40001, 40702 and 40727.

The proposed rules have met all legal noticing requirements, have been discussed with the regulated community and other interested parties, and reflect consideration of the input and comments of many affected and interested stakeholders.

G. Recommendations

Air District staff recommends adoption of proposed amendments Rule 6-5, Rule 11-10, and Rule 12-15 and certification of the CEQA Final Environmental Impact Report.

IX. REFERENCES

1. California Air Pollution Control Officers Association (CAPCOA), 1999. California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon leaks at Petroleum Facilities, February.

Appendices

- A. Valero Case Agreement: Enforcement Agreement and Agreement to Stay Litigation, March 24, 2017, re: *Valero, et al. v. Bay Area Air Quality Management District*, case number N16-0095, January 22, 2016, amended on February 16, 2016.
- B. WSPA Case Agreement: Settlement, Enforcement, and Release Agreement, March 1, 2018, re: *WSPA, et al. v. Bay Area Air Quality Management District*, case number N16-0963, May 25, 2016.
- C. Cooling Tower Hydrocarbon Emissions Estimates
- D. Summary of Comments and Responses on Proposed Amendments to Rules 6-5, 11-10, and 12-15 and Staff Report

Attachments

1. Final Staff Report – Rule 6-5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units; Amendments to Rule 8-18: Equipment Leaks; and Amendments to Rule 11-10: Hexavalent Chromium from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers, December 10, 2015
2. Final Staff Report – Rule 12-15: Petroleum Refining Emissions Tracking, April 20, 2016

APPENDIX A

Enforcement Agreement and Agreement to Stay Litigation, March 24, 2017, re: Valero, et al. v. Bay Area Air Quality Management District, case number N16-0095 (Valero Case Agreement)

ENFORCEMENT AGREEMENT AND AGREEMENT TO STAY LITIGATION

This Agreement, entered into as of March 24, 2017, is made by and between VALERO REFINING COMPANY—CALIFORNIA, TESORO REFINING & MARKETING COMPANY, LLC, and PHILLIPS 66 COMPANY (collectively, the “**Petitioners**”) and the BAY AREA AIR QUALITY MANAGEMENT DISTRICT (the “**District**”), each sometimes referred to herein as a “Party,” or collectively as the “Parties.”

RECITALS

The District is the agency with primary responsibility for the control of air pollution from stationary sources in the San Francisco Bay Area Air Basin.

The San Francisco Bay Area Air Basin encompasses Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and the southern portions of Solano and Sonoma Counties.

Petitioners each operate petroleum refining facilities that are within the San Francisco Bay Area Air Basin and are regulated by the District.

On December 16, 2015, the District and its Board approved an Initial Study/Negative Declaration and the adoption or amendment of the three regulations to which Petitioners are subject. These three rules are entitled: Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (“**Rule 6-5**”); Regulation 8, Rule 18: Equipment Leaks (“**Rule 8-18**”); and Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers (“**Rule 11-10**”). Collectively, these three rules are sometimes referred to herein as the “**Challenged Rules**.”

On January 22, 2016, Petitioners filed a Petition and Complaint in the Superior Court for the State of California for the County of Contra Costa and filed an Amended Petition and Complaint on February 16, 2016, which were docketed as *Valero, et al. v. Bay Area Air Quality Management District*, case number N16-0095 (the “**Lawsuit**”).

- a. In the Lawsuit, Petitioners alleged, among other things, that the District’s adoption of the Initial Study/Negative Declaration and the Challenged Rules violated the California Environmental Quality Act (“**CEQA**”) and its implementing regulations (Pub. Res. Code §21000 et seq.; Cal. Code Regs., title 14, § 15000 et seq.); certain provisions of the California Health & Safety Code, (H&SC §§ 40000-4608); and California common law.
- b. The District filed its Answer to the Lawsuit on August 2, 2016 and filed an Amended Answer on August 11, 2016. In its Answers, the District denied that it violated California Law when adopting the Initial Study/Negative Declaration and the Challenged Rules.
- c. Parties completed briefing in the Lawsuit on November 23, 2016.
- d. A hearing in the lawsuit was set by the court for January 27, 2017. By joint stipulation and the Court’s approval, the hearing has been rescheduled for April 14, 2017.

The purpose of this Agreement, which the Parties have negotiated in good faith, is to establish terms, conditions, and a framework for further analysis that will help facilitate full settlement of the Lawsuit. The Parties are engaged in continuing settlement discussions and are making progress towards a mutually satisfactory resolution of the Lawsuit. At the same time, the Parties acknowledge that additional study and analysis is required before full resolution of the Lawsuit is possible.

The Parties have agreed to work together to complete an ongoing heavy liquid component emissions study already being jointly conducted by the District and Petitioners, and hereby acknowledge that the results of that study and other ongoing analyses will inform future actions related to the Lawsuit and amendments to the Challenged Rules.

The Parties acknowledge that any amendments to the Challenged Rules contemplated by this Agreement are subject to the requirements of the District's rulemaking procedures and other applicable laws governing administrative or regulatory action in the State of California.

NOW, THEREFORE, based on the foregoing recitals and in consideration of the mutual promises, covenants, and obligations herein, the sufficiency of which consideration is hereby acknowledged, the Parties agree as follows:

ARTICLE 1: STAY OF LITIGATION

1.1. The Parties agree to seek and maintain a stay of litigation in the Lawsuit, up to and including the earlier of November 1, 2018 or the termination or expiration of this Agreement, including without limitation a delay, postponement, and stay of any further merits briefing and hearing (the "*Stay of Litigation*"). The Stay of Litigation shall not encompass any motions or status reports filed by the Parties to maintain or alter the duration of the Stay of Litigation or to enforce their rights under this Agreement.

1.2. The Parties shall jointly and immediately notify the court of the execution of this Agreement and request, through an appropriate filing with the court, the Stay of Litigation. The Parties further agree to seek leave of the court to allow for status reports to be filed by the Parties every six months during the Stay of Litigation.

1.3. The parties agree to jointly file any motions, status reports, and other papers necessary to obtain and maintain the Stay of Litigation, and no Party shall take any action to frustrate or remove the Stay of Litigation, except in the event of the termination or expiration of this Agreement for any reason.

1.4. In the event that the court lifts the Stay of Litigation prior to the Termination Date of this Agreement, each Party shall have the right, but not the obligation, to terminate this Agreement by providing written notice to all other Parties, in which case no Party shall have any continuing obligation hereunder.

1.5. Nothing in this Article 1 is intended to waive, abridge, abrogate, or limit any procedural or substantive right, claim, or defense that:

a. Petitioners or the District may have with respect to the Challenged Rules and the Lawsuit;

b. Petitioners or the District may have with respect to any other regulatory action undertaken by the District and any related litigation, including but not limited to Case Number N16-0963 pending in the Superior Court for the State of California for the County of Contra Costa.

1.6. Nothing in this Article 1 is intended to waive any right of any Party to prosecute or defend the Lawsuit, or to seek a trial in the Lawsuit, in the event that:

a. the Parties, despite taking all reasonable and appropriate actions, are unable to obtain or maintain the Stay of Litigation due to an action of the court;

b. the court lifts or removes the Stay of Litigation or otherwise sets a date for briefing or trial in the Lawsuit; or

c. this Agreement terminates or expires.

ARTICLE 2: HEAVY LIQUIDS STUDY

2.1. The Parties agree to continue the ongoing heavy liquid component emissions study to assess air emissions that are directly related to refinery components in heavy liquid service (the “*Heavy Liquids Study*”).

2.2. The results of the Heavy Liquids Study will be evaluated in relation to amendment of the Challenged Rules and potential future settlement of the Lawsuit.

2.3. The parameters of the Heavy Liquids Study and each Party’s obligations related to the Heavy Liquids Study include, but are not limited to, the following:

a. The Heavy Liquids Study shall be conducted at five separate refineries that are subject to the District’s jurisdiction, including the three refineries owned or operated by the Petitioners.

(i) The five refineries to be included in the Heavy Liquids Study are: the Valero Benicia Refinery, the Tesoro Martinez Refinery, the Phillips 66 Rodeo Refinery, the Shell Oil Martinez Refinery, and the Chevron Richmond Refinery.

(ii) The Parties acknowledge that Shell Oil and Chevron are not parties to this Agreement or the Lawsuit and that neither the District nor the Petitioners can compel these entities, or their refinery operations, to participate in the Heavy Liquids Study as it is envisioned by this Agreement. To the extent that Shell Oil and/or Chevron do not agree to participate in the Heavy Liquids Study, or otherwise frustrate data collection and analysis with respect to their refinery operations, the Parties to this Agreement shall not be required to include Shell Oil and/or Chevron refinery facilities, as appropriate, in the Heavy Liquids Study.

b. On or before April 30, 2017, the District shall, in consultation with the Petitioners, produce a protocol describing:

(i) the data, parameters, and conditions to be included and evaluated in the Heavy Liquids Study; and

(ii) the format of the results of the Heavy Liquids Study.

The heavy liquids study protocol may be revised as appropriate to reflect lessons learned during the course of the study. Any such revision shall be made in consultation with the Petitioners.

c. The District shall meet with each of the five refineries included in the Heavy Liquids Study and coordinate data collection from each such refinery (subject to the limitations described in Section 2.3(a)(ii)).

d. Petitioners shall cooperate with the District and use commercially reasonable efforts to facilitate data collection and completion of the Heavy Liquids Study.

e. The Parties acknowledge that the data collection phase of the Heavy Liquids Study is estimated to take approximately two months each at the five separate refineries and is expected to conclude in November, 2017.

f. Following completion of the Heavy Liquids Study data collection phase at each refinery, the District shall meet with the refinery managers and/or other designees of the Petitioners at each refinery participating in the Heavy Liquids Study to discuss the data collection process, any issues encountered, exchange lessons learned and best practices related to data collection from equipment in heavy liquid service, and work to mutually resolve any issues in order to facilitate completion of the Heavy Liquids Study.

g. On or before March 31, 2018, the District shall analyze data and other findings of the Heavy Liquids Study and, in consultation with Petitioners, generate a written report documenting the results of the Heavy Liquids Study in accordance with the parameters of this Article 2.

ARTICLE 3: COMPLIANCE AND ENFORCEMENT

3.1. During the Term of this Agreement, and for twelve (12) calendar months following the termination or expiration of this Agreement, the District agrees that, with respect to Petitioners, and notwithstanding the language contained in any of the Challenged Rules, the District shall enforce (or not enforce, as applicable) the following provisions in lieu of corresponding provisions of the Challenged Rules (and any corresponding provisions or requirements contained in an applicable Title V Operating Permit or SIP) as follows:

a. **Rule 6-5.**

(i) The requirements of Rule 6-5 shall not apply to any Fluidized Catalytic Cracking Unit controlled or abated by a Flue Gas Scrubber providing abatement efficiencies that constituted Best Available Control Technology when permitted or constructed.

(ii) Provision 6-5-301, such that it shall not include any emissions limitations related to condensable particulate matter or sulfur dioxide.

b. **Rule 8-18.**

(i) Provision 8-18-306.1: mass emissions determinations are not required for leaks less than 3,000 ppm.

(ii) Provision 8-18-309 shall not apply to lubrication systems and lube oil.

(iii) Provisions 8-18-400 and 8-18-500 shall not apply to a category of equipment that handles organic liquids having an initial boiling point greater than 302° Fahrenheit. This provision of the Agreement shall remain in effect (and shall survive the Term of this Agreement) until the later of:

(A) November 1, 2018; or

(B) one year after the District publishes on the District website a finding that the provisions of 8-18-400 and 8-18-500 are cost-effective when applied to a category of equipment that handles organic liquids having an initial boiling point greater than 302° Fahrenheit; such cost-effectiveness finding shall take into consideration the results of the ongoing Heavy Liquids Study, or whatever portion of the study is completed prior to November 1, 2017.

(iv) With regard to connectors in heavy liquid service, compliance with 8-18-402 shall be achieved as follows: Each facility subject to this Regulation must submit a plan for identifying connectors in heavy liquid service subject to the rule to the Air Pollution Control Officer (“APCO”) by not later than 3 months after the date on which cost-effectiveness findings, if any, are published pursuant to Section 3.1(b)(iii)(B) of this Agreement. Such plan shall provide details of the facility’s plans, procedures, and/or methods for identifying the connectors and documenting compliance with the requirements of Regulation 8-18-401.6. This plan must be approved by the APCO. The approved plan must be implemented within a year of the date on which APCO approves such plan. Provided the plan is timely submitted, the facility is deemed in compliance with this requirement until such time as the APCO acts to approve or disapprove its plan.

(v) Provisions 8-18-502.6 and 503.5 the piping and instrumentation diagrams (“P&IDs”) described in the initially-adopted Rule 8-18-502.6 are not required to be submitted to the District; rather, they shall be maintained at the facility and made available to District for review upon request, and updated as needed in the ordinary course of business and in accordance with other regulatory requirements.

(vi) Provision 8-18-503.2: the submittal date for annual inventory updates shall be February 1 of each year.

c. **Rule 11-10.**

(i) Provision 11-10-105 (“Limited Exemption, Recirculation Rates Less Than 500 Gallons Per Minute and 11-10-106 Limited Exemption, Recirculation Rates Less Than 2,500 Gallons Per Minute”): the sampling and monitoring requirements for cooling towers with recirculation rates less than 2,500 gallons per minute shall be required on a weekly basis, except that a refinery may move to monthly sampling and monitoring for a particular cooling tower after four (4) weeks of sampling or monitoring results below the applicable leak action level, and

(A) in the event that sampling or monitoring identifies a result above the applicable leak action level, the refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and

(B) the relevant cooling tower shall be again eligible for monthly sampling after four (4) weeks of sampling or monitoring results below the applicable leak action level.

(ii) Provision 11-10-107 (“Limited Exemption Facilities not in Petroleum Refining Process Service”): cooling towers that are not in petroleum refining process service are excluded from the total hydrocarbon emission requirements of this provision. Lube oils and amine streams will be evaluated on a case-by case basis. Specific examples of cooling towers not in petroleum refining process service are those that serve power generation operations, hydrogen production facilities, and carbon dioxide recovery facilities located at petroleum refineries, provided their cooling systems are separate from those used in petroleum refining operations. Sulfur plants shall be evaluated on a case-by-case basis. Refining process service is limited to refinery process units that handle petroleum hydrocarbons.

(iii) Provision 11-10-304 (“Total Hydrocarbon Leak Monitoring Requirement”): the sampling and monitoring requirements contained in Sections 304.1 and 304.3 for cooling towers with recirculation rates greater than 2,500 gallons per minute shall be required on a weekly basis, except that a refinery may move to bi-monthly sampling and monitoring for a particular cooling tower after six (6) months of weekly sampling or monitoring results below the applicable leak action level, and

(A) in the event that sampling or monitoring identifies a result above the applicable leak action level, the refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and

(B) the relevant cooling tower shall be again eligible for bi-monthly sampling after six (6) months of sampling or monitoring results below the applicable leak action level.

(iv) Provision 11-10-305 (“Leak Action Requirement”):

(A) the cooling tower owner/operator shall minimize leaks greater than the applicable leak action level as soon as practicable or within seven (7) calendar days;

(B) the delay of repair criteria contained in 40 C.F.R. 63.654(f)-(g) shall apply; and

(C) if applicable, the cooling tower owner/operator shall speciate Toxic Air Contaminants (TACs) within 72 hours.

(v) Provision 11-10-401 (“Petroleum Refinery Cooling Tower Reporting Requirements”):

(A) the time for notice pursuant to 401.1 shall be 72 hours and such notices are not required to include pH levels or iron concentrations. Notwithstanding the previous sentence, sampling for chlorine and hydrocarbons shall occur as soon as is feasible and in no event later than 24 hours following discovery of the leak;

(B) the delay of repair criteria contained in 40 C.F.R. 63.654(f)-(g) shall apply; and

(C) Petitioners are not obligated to provide a list of heat exchangers to the District.

(vi) Provision 11-10-402 (“Best Modern Practices”): this Provision shall not apply to Petitioners.

(vii) Provision 11-10-504 (“Operating Records”): Petitioners are not obligated to provide to the District any information, pursuant to this Provision, related to “best modern practices employed.”

3.2. The District agrees that, in addition to interpreting and enforcing the foregoing provisions during the Term of this Agreement consistent with the language and terms of this Article 3, the District shall not encourage or aid any other Person to enforce the provisions of the Challenged Rules addressed in this Article 3 against Petitioners, except as they are described herein.

3.3. During the Term of this Agreement, and for twelve (12) calendar months following the termination or expiration of this Agreement the District agrees that, with respect to each of the Petitioners, compliance with the terms and conditions of this Agreement and, in particular, the provisions of Sections 3.1(a)-(c), shall constitute compliance, or being on a schedule of compliance, with the requirements of the provisions of the Challenged Rules referenced herein, to the extent that each such requirement applies to each Petitioner.

3.4. For avoidance of doubt, the provisions of this Article 3 shall survive for a period of twelve (12) months the termination, cancellation, invalidation, or expiration of this Agreement for any reason including, without limitation, termination pursuant to a right of termination contained herein.

ARTICLE 4: RULE MODIFICATIONS

4.1. Prior to the expiration of the Term of this Agreement, and subject to Section 2 of this Article, the District shall propose amendments to the Challenged Rules to its Board, and/or take other action as follows:

a. **Rule 6-5.**

(i) Propose an amendment to Rule 6-5 to clarify that Rule 6-5 does not apply to any Fluidized Catalytic Cracking Unit with an installed Wet Scrubber or Flue Gas Scrubber, or adopt implementation guidance to the same effect.

(ii) Either propose an amendment to Provision 6-5-301 to remove references to emissions limitations related to condensable particulate matter or sulfur dioxide, or propose emissions limitations related to these pollutants.

b. **Rule 8-18.**

(i) With respect to provisions 8-18-400 and 8-18-500, the District shall either:

(A) propose an amendment to Rule 8-18, or adopt implementation guidance, to clarify that Provisions 8-18-400 and 8-18-500 shall not apply to a category of equipment that handles organic liquids having an initial boiling point greater than 302° F or;

(B) make a finding on the record, based on the results of the Heavy Liquids Study, that the provisions of 8-18-400 and 8-18-500 are cost-effective when applied to a category of equipment that handles organic liquids having an initial boiling point greater than 302° Fahrenheit; the District's cost of effectiveness analysis shall differentiate between classes of equipment and service types and take into consideration the differences between heavy liquid components' varying physical and operational characteristics, emissions, and leak rates and, if necessary, make different findings for different classes of equipment and service types.

(ii) With respect to provisions 8-18-502.6 and 8-18-503.5, the District shall:

(A) Propose an amendment to Rule 8-18, or adopt implementation guidance to clarify that submissions of P&IDs to the District will not be required pursuant to 8-18-503.5 provided the information is maintained onsite by the facility and made available to the District upon request.

(iii) With respect to provision 8-18-309, the District shall, based on results of the Heavy Liquid Study, evaluate whether this provision should apply to lubrication systems and lube oil, and shall propose to exclude lubrication systems if appropriate.

(iv) With respect to provision 8-18-402, the District shall propose an amendment to Rule 8-18, or adopt implementation guidance to clarify that each facility subject to Rule 8-18 must submit a plan for identifying connectors in heavy liquid service subject to the rule to the Air Pollution Control Officer ("APCO") by not later than 3

months after the date on which cost-effectiveness findings, if any, are published pursuant to Section 3.1(b)(iii)(B) of this Agreement or another later date that is appropriate under the circumstances. Such plans shall provide details of the facility's plans, procedures, and/or methods for identifying the connectors and documenting compliance with the requirements of Regulation 8-18-401.6. This plan must be approved by the APCO. The approved plan must be implemented within a year of the date on which APCO approves such plan. Provided the plan is timely submitted, the facility is deemed in compliance with this requirement until such time as the APCO acts to approve or disapprove its plan.

(v) With respect to provisions 8-18-306 and 8-18-311, the District shall evaluate in a publicly available document (e.g., a staff report) and, if appropriate, propose an amendment to provision 8-18-306 (or a corresponding provision, if renumbered), or adopt implementation guidance, to clarify that mass emissions determinations are not required for leaks less than 3,000 ppm.

(vi) With respect to provision 8-18-503.2, the District shall either propose an amendment to Rule 8-18, or adopt implementation guidance, to clarify that the submittal date for annual inventory updates identified in 8-18-503.2 shall be February 1 of each year.

c. **Rule 11-10.**

(i) With respect to provision 11-10-105, the District shall propose an amendment such that the sampling and monitoring requirements for cooling towers with recirculation rates less than 2,500 gallons per minute shall be required on a weekly basis, except that a refinery may move to monthly sampling and monitoring for a particular cooling tower after four (4) weeks of sampling or monitoring results below the applicable leak action level, and:

(A) in the event that sampling or monitoring identifies a result above the applicable leak action level, the refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and

(B) the relevant cooling tower shall be again eligible for monthly sampling after four (4) weeks of sampling or monitoring results below the applicable leak action level.

(ii) With respect to provision 11-10-107, the District shall propose an amendment to clarify that cooling towers that are not in petroleum refining process service are excluded from the total hydrocarbon emission requirements of this provision. Such amendment shall also provide specific examples of cooling towers not in petroleum refining process service, including those that serve power generation operations, hydrogen production facilities, and carbon dioxide recovery facilities located at petroleum refineries (provided their cooling systems are separate from those used in petroleum refining operations); refining process service is limited to refinery process units that handle petroleum hydrocarbons; and that sulfur plants shall be evaluated on a case-by-case basis. The District shall also consider, based on results of the Heavy

Liquids Study, whether lube oils and amine streams, or some subset thereof, should be determined not to be in refining process service for purposes of provision 11-10-107, and shall propose amendments to provision 11-10-107 reflecting any such determination. The review described in the preceding sentence is supplemental to, and not in lieu of, any case-by-case review of amine streams and lube oils pursuant to provision 11-10-107.

(iii) With respect to provision 11-10-304, the District shall propose an amendment such that the sampling and monitoring requirements contained in Sections 304.1 and 304.3 for cooling towers with recirculation rates greater than 2,500 gallons per minute shall be required on a weekly basis, except that a refinery may move to bi-monthly sampling and monitoring for a particular cooling tower after six (6) months of weekly sampling or monitoring results below the applicable leak action level, and

(A) in the event that sampling or monitoring identifies a result above the applicable leak action level, the refinery must revert to a weekly sampling or monitoring schedule for the relevant cooling tower; and

(B) the relevant cooling tower shall be again eligible for bi-monthly sampling after six (6) months of sampling or monitoring results below the applicable leak action level.

(iv) With respect to provision 11-10-305, the District shall propose an amendment such that 11-10-305 is modified as follows:

(A) the cooling tower owner/operator shall minimize leaks greater than the applicable leak action level as soon as practicable or within seven (7) calendar days;

(B) the delay of repair criteria contained in 40 C.F.R. 63.654(f)-(g) shall apply; and

(C) if applicable, the cooling tower owner/operator shall speciate Toxic Air Contaminants (TACs) within 72 hours.

(v) With respect to, provision 11-10-401, the District shall propose an amendment such that 11-10-401 is modified as follows:

(A) the time for notice pursuant to 401.1 shall be 72 hours and such notices are not required to include pH levels or iron concentrations. Notwithstanding the previous sentence, sampling shall occur as soon as is feasible and in no event later than 24 hours after discovery of the leak;

(B) the delay of repair criteria contained in 40 C.F.R. 63.654(f)-(g) shall apply; and

(C) Petitioners are not obligated to provide a list of heat exchangers to the District.

(vi) With respect to provision 11-10-402 (“Best Modern Practices”), the District shall propose an amendment such that 11-10-402 is eliminated from Rule 11-10 or does not apply to Petitioners.

(vii) With respect to provision 11-10-504, the District shall propose an amendment modifying 11-10-504 to clarify that Petitioners are not obligated to provide to the District any information, pursuant to this Provision, related to “best modern practices employed.”

4.2. Petitioners acknowledge that certain modifications to the Challenged Rules described in Section 1 of this Article may, in some instances, be addressed by the District through implementation guidance rather than a formal rule amendment. To facilitate that process, and notwithstanding any requirements imposed by Section 1 of this Article to propose rule amendments:

- a. During the Term of this Agreement, the District may propose draft guidance documents to Petitioners in lieu of individual rule amendments contemplated by Section 1 of this Article;
- b. Petitioners shall review draft guidance documents proposed by the District and provide the District with a written response within thirty (30) calendar days indicating whether the proposed guidance is acceptable as drafted; and
- c. in the event Petitioners deem, in writing, that a particular guidance document is acceptable, adoption of that same guidance by the District shall satisfy the corresponding obligation in Section 1 of this Agreement (such that the District shall not be required to propose a formal rule amendment with respect to the relevant rule provision or provisions).

4.3. The District shall make good-faith efforts to complete the various actions contemplated by Section 1 of this Article. Such efforts shall include, but are not limited to:

- a. Completing the Heavy Liquids Study and any other studies or analyses in a timely and workmanlike manner;
- b. Drafting and proposing any rule amendments or guidance documents in a timely manner;
- c. Complying with all applicable rulemaking procedures;
- d. Placing sufficient information in the administrative record to justify and support each rule amendment, regulatory action, or guidance document;
- e. Defending any rule amendments, regulatory actions, and guidance documents during the public notice-and-comment period, if required; and
- f. Defending any rule amendments, regulatory actions, and guidance documents from administrative or judicial challenge brought by any Person other than Petitioners, if required.

ARTICLE 5: DEFINITIONS

The following capitalized terms used in this Agreement shall have the meanings respectively specified or referenced:

“**Adopt**” means the approval of a resolution by the Board adopting a new or modified rule or regulation, with the effect of making that rule or regulation final and effective as of the applicable effective date contained in the rule or regulation.

“**Board**” or “**The Board**” means the District’s Board of Directors.

“**Breach Notice**” is defined in Section 6.15(b).

“**Breaching Party**” is a Party that commits a Default Event.

“**CEQA**”, or the “**California Environmental Quality Act**”, is defined in the Recitals.

“**Challenged Rules**” is defined in the Recitals.

“**Default Event**” is defined in Section 6.14(a).

“**Effective Date**” is defined in Section 6.2(a).

“**Flue Gas Scrubber**” means a pollution control device employing wet, spray dry, or dry technology to reduce emissions of sulfur dioxide to the atmosphere through absorption and/or reaction processes, and which are sometimes referred to as a “flue gas desulfurization” unit or simply as a “scrubber”.

“**Heavy Liquids Study**” is defined in Section 2.1.

“**Lawsuit**” is defined in the Recitals.

“**Losses**” means any liability, claim, demand, damage, loss, fine, penalty, expense or cost, of any kind or description, including, but not limited to, judgments, liens, expenses (including, but not limited to, court costs and attorneys’ fees) and amounts agreed upon in settlement, but expressly excluding expectation losses or damages and punitive damages.

“**Person**” means any natural person, entity or governmental authority including, but not limited to, any corporation, firm, limited liability company, joint venture, partnership, trust, unincorporated organization or any department or agency of any governmental authority.

“**PPM**” or the lowercase “**ppm**” means parts per million.

“**Rule 6-5**” is defined in the Recitals.

“**Rule 8-18**” is defined in the Recitals.

“**Rule 11-10**” is defined in the Recitals.

“**SIP**” means a California State Implementation Plan that is adopted by the California Air Resources Board and approved by the United States Environmental Protection Agency in accordance with the federal Clean Air Act.

“*Stay of Litigation*” is defined in Section 1.1.

“*Term*” is defined in Section 6.2(c).

“*Termination Date*” is defined in Section 6.2(b).

“*Title V Operating Permit*” means a stationary source operating permit issued to the owner or operator of such facility pursuant to Title V of the federal Clean Air Act, including all matters incorporated into such permits by reference and any pending revision revisions to such permits.

ARTICLE 6: MISCELLANEOUS PROVISIONS

6.1. Scope of Agreement.

- a. This Agreement is binding upon the Parties only with respect to the matters specifically addressed herein and does not otherwise bind Petitioners or the District.
- b. This Agreement does not alter, waive, or abrogate any right that any Party may have to prosecute or defend the Lawsuit in the event of termination or expiration of this Agreement or an applicable order of the court compelling a trial or other resolution of the Lawsuit.
- c. This Agreement does not alter, waive, or abrogate any right that any Party may have to prosecute or defend any currently pending litigation related to regulatory actions other than the Challenged Rules, including but not limited to Case Number N16-0963 in the Superior Court for the State of California for the County of Contra Costa.
- d. This Agreement does not alter, waive, or abrogate any right that Petitioners may have to bring an administrative or judicial challenge to any pending or future rule, regulation, or regulatory action taken by the District.

6.2. Effective Date, Term.

- a. This Agreement commences as of March 24, 2017 (the “*Effective Date*”).
- b. This Agreement terminates on November 1, 2018 (the “*Termination Date*”) unless terminated earlier pursuant to a right of termination herein, or extended by mutual written agreement by the Parties, subject to approval of the court.
- c. The term of this Agreement (the “*Term*”) will begin on the Effective Date and, unless this Agreement is earlier terminated by a Party pursuant a right of termination in this Agreement, will expire upon the Termination Date. The term may be extended by mutual written agreement by the Parties, subject to approval of the court.

6.3. Successors and Assigns. This Agreement may not be assigned by any Party without the express written consent of all of the other Parties, whose consent will not be unreasonably withheld. This Agreement is binding upon and shall inure to the benefit of the Parties, their respective successors, limited partners, agents, principals, and permitted assigns.

6.4. No Presumption Regarding Drafting Party. This Agreement is the result of negotiations between the Parties, and it is the product of all of the Parties. This Agreement shall not be construed against any Party because of the involvement of that Party or its counsel in the preparation or drafting of this Agreement.

6.5. Severability. If any term or provision of this Agreement is to any extent illegal, otherwise invalid, or incapable of being enforced, then such term or provision shall be excluded only to the extent of such invalidity or unenforceability and all other terms and provisions contained in this Agreement shall remain in full force and effect, subject to the following:

- a. if application of this severability provision should materially affect the substance of this Agreement and the actions contemplated herein, the Parties agree to negotiate in good faith to amend this Agreement to include a replacement provision suitable to all Parties to give effect to the original intent of the Parties;
- b. if the Parties are unable to reach agreement on a replacement provision within thirty (30) calendar days, the adversely impacted Party shall have the right but not obligation to terminate this Agreement, in which case neither Party shall have any further obligations hereunder; and
- c. in the event of such termination, the Parties agree to jointly seek to remove the Stay of Litigation described in Article 1.

6.6. Notices. All notices, requests, demands and other communications made under this Agreement shall be in writing and shall be deemed duly given if (i) hand delivered against a signed receipt therefor, (ii) sent by registered mail, return receipt requested, first class postage prepaid, or (iii) sent by internationally recognized overnight delivery service.

- a. Notices to Petitioners pursuant to this Agreement shall be sent to:

Valero Refining Company—California:

Name:	Megan Bluntzer
Email:	Megan.Bluntzer@valero.com
Telephone:	(210) 345-4009
Address:	1 Valero Way, San Antonio, TX 78249

Tesoro Refining & Marketing Company, LLC:

Name:	Stoney Vining
Email:	Stoney.K.Vining@tsocorp.com
Telephone:	(210) 626-4122
Address:	19100 Ridgewood Pkwy , San Antonio, TX 78259

Phillips 66 Company:

Name:	Manager, San Francisco Refinery at Rodeo
Email:	N/A
Telephone:	(510) 245-4415
Address:	1380 San Pablo Avenue, Rodeo, CA 94572

With a copy to Beveridge & Diamond P.C.:

Name:	David McCray
Email:	dmccray@bdlaw.com
Telephone:	(415) 262-4025
Address:	456 Montgomery Street, Suite 1800, San Francisco, CA 94104

b. Notices to the District pursuant to this Agreement shall be sent to:

Name:	Adan Schwartz
Email:	aschwartz@baaqmd.gov
Telephone:	(415) 749-4920
Address:	375 Beale St., San Francisco, 94105

With a copy to:

Name:	Eric Stevenson
Email:	estevenson@baaqmd.gov
Telephone:	(415) 749-4695
Address:	375 Beale St., San Francisco, 94105

c. Either Party may alter that Party's contact information for purposes of notices, at any time, by giving notice of such change in conformity with the provisions of this Section 6.6.

d. Notice shall be deemed to be effective: if hand delivered, when delivered; if mailed, at midnight on the third (3rd) business day after being sent by registered mail; and if sent by internationally recognized overnight delivery service, on the next business day following delivery to such delivery service.

e. The Parties acknowledge and agree that the foregoing provisions for the giving of notice are not intended to cover day-to-day communications between the Parties in the course of performing each such Party's duties and obligations hereunder, including, without limitation, communications related to conducting the Heavy Liquids Study.

f. The notice provisions contained in this Section 6.6 are not intended to alter in any way the procedures related to the District's regulatory and rulemaking processes, including but not limited to the provision of adequate public notice of regulatory actions,

submission of public comments on such actions, and other notifications and procedures required or customary with respect to District's regulatory actions.

6.7. Governing Law; Venue. This Agreement shall be governed by and construed in accordance with the laws of California, without giving effect to any choice or conflict of law provision or rule (whether of the State of California or any other jurisdiction). Any action, proceeding or suit arising out of or based upon this Agreement or shall be instituted in the Superior Court for the State of California for the County of Contra Costa.

6.8. Recitals. The Recitals set forth in this Agreement are a material part of this Agreement and are hereby expressly incorporated by reference as though expressly set forth herein.

6.9. Authority.

a. Petitioners and the District hereby represent and warrant that they each have full power and authority to enable execute and deliver this Agreement and to perform their obligations hereunder.

b. Each of the undersigned individuals represents and warrants that s/he has read and understands this Agreement and has full and complete lawful authority to bind the respective Party and any respective principals, successors, subsidiaries, partners, limited partners, agents and assigns to this Agreement.

6.10. Entire Agreement. This Agreement, including any Appendices hereto, constitutes the full, complete and final statement of Petitioners and the District on the matters addressed by this Agreement. The Parties acknowledge that this Agreement contains the entire understanding between the Parties with respect to the matters addressed by this Agreement.

6.11. Amendments in writing. This Agreement may be amended or modified only by a written instrument signed by authorized representatives of all Parties.

6.12. Waiver. Any waiver of any provision or term of this Agreement shall be effective only if in writing and signed by all Parties. The waiver of any provision or term of this Agreement shall not be deemed as a waiver of any other provision of this Agreement.

6.13. No Third Party Beneficiaries. There are no third-party beneficiaries to this Agreement and nothing expressed, implied, or referred to in this Agreement will be construed to give any Person, other than the Parties to this Agreement, any legal or equitable right, remedy, or claim under or with respect to this Agreement or any provision of this Agreement, except such rights as may inure to the predecessors, successors, subsidiaries partners, limited partners, agents, principals, and permitted assigns of each Party.

6.14. Breach, Termination.

a. Default Events. Any material breach of any provision of this Agreement shall constitute a "**Default Event**." In the event of a Default Event, the non-defaulting Party may take any remedies available to it under applicable law and this Section 6.14.

b. Notice of breach.

(i) In the event any Party commits a Default Event, and has knowledge of that Default Event, the Breaching Party shall give immediate notice to all other Parties describing the Default Event in reasonable detail and identifying which section(s) of this Agreement the Breaching Party has materially breached.

(ii) A Party may issue notice to any other Party upon gaining knowledge of a Default Event by the other Party, identifying which section(s) of this Agreement that Party has allegedly materially breached (each such notice, a “**Breach Notice**”).

c. Termination in Event of Default. Each Party shall have the right, but not the obligation, to terminate this Agreement upon written notice to all other Parties of a Default Event that is not remedied and cured in all material respects by the Breaching Party within thirty (30) calendar days after the date of a corresponding Breach Notice.

d. Remedies in event of termination following a default event. In the event of termination of this Agreement pursuant to Section 6.14(c):

(i) the non-Breaching Party shall have the right to lift the Stay of Litigation described in Article 1 and to take make any filings with the court necessary to facilitate such removal of the Stay of Litigation; and

(ii) the non-Breaching Party also shall have the right to any and all legal and equitable remedies available to it under applicable law.

6.15. Reasonable Cooperation. The Parties agree to provide reasonable cooperation to each other as may be necessary to give effect to this Agreement. The Parties agree to meet monthly to discuss the Heavy Liquid Study progress, related issues, and to foster communication. The Parties agree that at least one such meeting will be held in person each quarter. The remaining meetings may be held in person and/or by teleconference.


6.16. Time is of the Essence. Time is of the essence with respect to the completion of each Party’s obligations under this Agreement. This is a material provision of this Agreement.

6.17. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall have the same force and effect as an original, but all of which together shall constitute one and the same instrument.

[Signature page(s) follow]

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

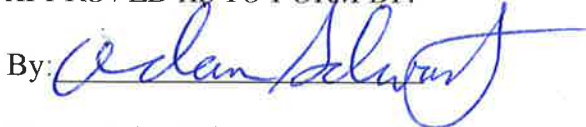
**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

By: 
Name: Jack P. Broadbent

Title: Executive Officer/APCO

Dated: 3/28/17

APPROVED AS TO FORM BY:

By: 
Name: Adan Schwartz

Title: Senior Assistant Counsel, Bay Area
Air Quality Management District

Dated: March 24, 2017

**VALERO REFINING COMPANY—
CALIFORNIA**

By: _____

Name: Don Wilson

Title: VP and General Manager

Dated: _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

By: _____

Name: Thomas A Lu

Title: Vice President, Martinez Refinery

Dated: _____

PHILLIPS 66 COMPANY

By: _____

Name: Mark Evans

Title: Refinery Manager

Dated: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

By: _____

Name: Jack P. Broadbent

Title: Executive Officer/APCO

Dated: _____

APPROVED AS TO FORM BY:

By: _____

Name: Adan Schwartz

Title: Senior Assistant Counsel, Bay Area
Air Quality Management District

Dated: _____

**VALERO REFINING COMPANY—
CALIFORNIA**

By: Don Wilson *MQB*

Name: Don Wilson

Title: VP and General Manager

Dated: 3/23/17

**TESORO REFINING & MARKETING
COMPANY, LLC**

By: _____

Name: Thomas A Lu

Title: Vice President, Martinez Refinery

Dated: _____

PHILLIPS 66 COMPANY

By: _____

Name: Mark Evans

Title: Refinery Manager

Dated: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

By: _____

Name: Jack P. Broadbent

Title: Executive Officer/APCO

Dated: _____

APPROVED AS TO FORM BY:

By: _____

Name: Adan Schwartz

Title: Senior Assistant Counsel, Bay Area
Air Quality Management District

Dated: _____

**VALERO REFINING COMPANY—
CALIFORNIA**

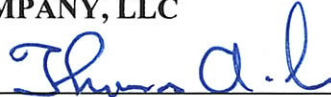
By: _____

Name: Don Wilson

Title: VP and General Manager

Dated: _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

By: 

^{MWA}
Name: Thomas A Lu

Title: Vice President, Martinez Refinery

Dated: 3/23/2017

PHILLIPS 66 COMPANY

By: _____

Name: Mark Evans

Title: Refinery Manager

Dated: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

By: _____

Name Jack P Broadbent

Title: Executive Officer/APCO

Dated: _____

APPROVED AS TO FORM BY

By _____

Name. Adan Schwartz

Title. Senior Assistant Counsel, Bay Area
Air Quality Management District

Dated. _____

**VALERO REFINING COMPANY—
CALIFORNIA**

By: _____

Name: Don Wilson

Title. VP and General Manager

Dated _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

By _____

Name: Thomas A Lu

Title: Vice President, Martinez Refinery

Dated: _____

PHILLIPS 66 COMPANY

By:  _____

Name: Mark Evans

Title: Refinery Manager

Dated: 3/24/2017

APPENDIX B

Settlement, Enforcement, and Release Agreement, March 1, 2018, re: WSPA, et al. v. Bay Area Air Quality Management District, case number N16-0963 (WSPA Case Agreement)

SETTLEMENT, ENFORCEMENT, AND RELEASE AGREEMENT

This Settlement, Enforcement, and Release Agreement (“Agreement”) is entered into as of the last date of execution of the Agreement, by and between the WESTERN STATES PETROLEUM ASSOCIATION (“WSPA”), VALERO REFINING COMPANY—CALIFORNIA (“Valero”), TESORO REFINING & MARKETING COMPANY, LLC (“Tesoro”), and PHILLIPS 66 COMPANY (“Phillips 66”) (collectively, the “Petitioners”) and the BAY AREA AIR QUALITY MANAGEMENT DISTRICT (the “District”), each sometimes referred to herein as a “Party,” or collectively as the “Parties.”

RECITALS

The District is the agency with primary responsibility for the control of air pollution from stationary sources in the San Francisco Bay Area Air Basin.

The San Francisco Bay Area Air Basin encompasses Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and the southern portions of Solano and Sonoma Counties.

Petitioner WSPA is a non-profit trade association representing twenty-six companies that explore for, produce, refine, transport, and market petroleum, petroleum products, natural gas, and other energy supplies in California, Arizona, Nevada, Oregon, and Washington. WSPA’s members include Chevron Products Company, Shell Martinez Refinery, Phillips 66, Tesoro, and Valero (collectively, “WSPA Members”), all of which have operations and facilities in the Bay Area that are regulated by the District.

Individually named Petitioners Valero, Tesoro, and Phillips 66 each operate petroleum refining facilities that are within the San Francisco Bay Area Air Basin and are regulated by the District.

On April 20, 2016, the District and its Board approved and adopted Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (“Rule 12-15”); and Regulation 9, Rule 14: Petroleum Coke Calcining Operations (“Rule 9-14”). Collectively, these rules are sometimes referred to herein as the “*Challenged Rules*.”

On May 25, 2016, Petitioners filed a Petition and Complaint in the Superior Court for the State of California for the County of Contra Costa which was docketed as *WSPA, et al. v. Bay Area Air Quality Management District*, case number N16-0963 (the “Lawsuit”).

In the Lawsuit, Petitioners allege, among other things, that the District’s adoption of the Initial Study/Negative Declaration and the Challenged Rules violated the California Environmental Quality Act (“CEQA”) and its implementing regulations (Pub. Res. Code §21000 et seq.; Cal. Code Regs., title 14, § 15000 et seq.); certain provisions of the California Health & Safety Code, (H&SC §§ 40000-4608); and California common law.

The District filed its Answer to the Lawsuit on November 4, 2016. In its Answer, the District denies that it violated California law when adopting the Initial Study/Negative Declaration and the Challenged Rules.

The Parties have completed briefing the matter and a hearing date has been set for March 5, 2018.

On July 26, 2017, the Governor of California signed into law Assembly Bill No. 617 (“AB 617”) which amends Section 39607(b) of the Health and Safety Code to require the California Air Resources Board (“CARB”) to establish “a uniform statewide system of annual reporting of emissions of criteria pollutants and toxic air contaminants for a stationary source.” The Parties acknowledge that implementation of this Agreement may be affected by AB 617 or implementing regulations adopted by CARB.

NOW, THEREFORE, based on the foregoing recitals and in consideration of the mutual promises, covenants, and obligations herein, the sufficiency of which consideration is hereby acknowledged, the Parties agree to the following terms in settlement of this lawsuit:

SECTION 1: ENFORCEMENT

1.1. The District agrees that, until Rule 12-15 is amended as provided for in Section 2 of this Agreement, it shall enforce Rule 12-15 against Petitioners only in accordance with the modified language and provisions contained in Appendix A of this Agreement, which is attached hereto and hereby fully incorporated into and made part of this Agreement (“Appendix A”).

1.2. Petitioners agree to comply with the modified language and provisions of Rule 12-15 contained in Appendix A until Rule 12-15 is amended by the District as provided for below in Section 2.

1.3. Petitioners’ compliance with the modified language and provisions of Rule 12-15 as it appears in Appendix A shall constitute compliance, or being on a schedule of compliance, with the requirements of Rule 12-15.

1.4. For avoidance of doubt, any provision of Rule 12-15 not identified in Appendix A is not modified or altered by this Agreement.

1.5. It is the understanding of the parties that, pursuant to Section 12-15-408.1, should the Refineries not have historical data kept in the ordinary course of business, the absence of such data will not, in and of itself, trigger New Source Review permitting requirements under Rules 2-1 or 2-2. Nothing herein is intended to restrict the District’s options in a future revision to Rules 2-1 or 2-2.

1.6. As of the Effective Date of this Agreement, the District and Petitioners are discussing whether Petitioners are required to report emissions from stationary sources that are temporarily located on site to perform tasks at refineries, but are permitted to other entities (“Temporary Sources”) for purposes of the Section 12-15-206 Emissions Inventory. The District agrees that, until a future rule adoption specifically and expressly requires the reporting of emissions data for Temporary Sources by Petitioners, the District will not seek to expand reporting under Rule 12-15 beyond what is currently practiced in the annual update. Notwithstanding the preceding sentence, the District may require that Petitioners continue to report emissions from Temporary Sources that have previously been included in the annual updates for refinery permit renewals.

This paragraph only addresses Petitioners' obligation to report. Nothing in the paragraph is intended to limit the District's ability to estimate emissions from Temporary Sources.

1.7. The Parties are currently undertaking a Heavy Liquids Study, pursuant to a separate agreement, to measure and assess emissions from certain components in heavy liquid service at Bay Area refineries ("Heavy Liquids Study"). The Parties agree that pending completion of the Heavy Liquid Study and the establishment of new emissions factors based upon the results of the Heavy Liquids Study, the interim Heavy Liquids Emissions Factors depicted in Appendix A, Section 12-15-401, below, will be utilized for purposes of complying with and enforcing Rule 12-15, as well as for all other District purposes, including but not limited to, emissions permit fees and rule-making.

SECTION 2: AMENDMENT OF RULE 12-15.

2.1. The Parties agree and acknowledge that:

- a. the modified language, provisions, and comments appearing in Appendix A represent the intent of the Parties with respect to modifying Rule 12-15 and that;
- b. such language is the result of good faith, arms-length negotiations regarding the appropriate and legal scope of Rule 12-15.

2.2. Within nine (9) months of the Effective Date, the District shall propose for adoption amendments to Rule 12-15 in accordance with the modified language and comments set forth in in Appendix A.

SECTION 3: DISMISSAL OF LAWSUIT

3.1. Within thirty (30) calendar days of the adoption of revisions to Rule 12-15 that are in accordance with Section 2 of this Agreement, or other revisions that are otherwise acceptable to Petitioners, Petitioners shall make an appropriate filing with the court seeking voluntary dismissal of the Lawsuit, inclusive of all causes of action therein, with prejudice.

3.2. Notwithstanding the forgoing, this Agreement does not alter, waive, or abrogate any right that any Party may have to (i) prosecute or defend the Lawsuit in the event that a Party commits a material breach of any provision herein, including but not limited to the District's failure to propose and/or adopt revisions to Rule 12-15 substantially similar to those contained in Appendix A or (ii) enforce the terms of this Agreement. Nor does this Agreement alter, waive, or abrogate any right that the Petitioners have to challenge future modifications or amendments to Rule 12-15, or to any other rule or regulation, that the District may propose and/or adopt.

3.3. Effective on the same day as dismissal of the lawsuit in accordance with this Section 3, should such dismissal be granted by the court, the Parties, through this agreement and subject to Section 3.2, shall release and forever discharge each other from any and all claims, debts, damages, liabilities, demands, obligations, costs, expenses, attorney fees, disputes, actions and causes of action of every nature, whether known or unknown, suspected or unsuspected, that each Party may hold or have against each other as a result of the subject of the Lawsuit,

including, but not limited to those claims set forth in the Lawsuit, all of which are incorporated herein fully by reference.

SECTION 4: MISCELLANEOUS PROVISIONS

4.1. Scope of Agreement.

- a. This Agreement is binding upon the Parties only with respect to the matters specifically addressed herein and does not otherwise bind Petitioners or the District.
- b. This Agreement does not alter, waive, or abrogate any right that any Party may have to prosecute or defend any currently pending litigation related to regulatory actions other than the Challenged Rules, including but not limited to Case Number N16-0095 (*Valero et al. v. BAAQMD*) and Case Number N17-2300 (*WSPA et al. v BAAQMD*).
- c. This Agreement does not alter, waive, or abrogate any right that Petitioners may have to bring an administrative or judicial challenge to any pending or future rule, regulation, or regulatory action taken by the District.
- d. In entering into this Agreement, the Petitioners expressly reserve and do not waive any arguments they may have, either singularly or collectively, in part or all together, to allege and prosecute any and all claims that rules other than the Challenged Rules are part of the same CEQA “project” as the Challenged Rules and in violation of CEQA. Further, the District agrees that it will not oppose such claims by arguing that dismissal of the Lawsuit is evidence that illegal “piecemealing” did not occur.

4.2. No Presumption Regarding Drafting Party. This Agreement is the result of arms-length negotiations between the Parties, and it is the product of all of the Parties. This Agreement shall not be construed against any Party because of the involvement of that Party or its counsel in the preparation or drafting of this Agreement.

4.3. Severability. If any term or provision of this Agreement is to any extent illegal, otherwise invalid, or incapable of being enforced, then such term or provision shall be excluded only to the extent of such invalidity or unenforceability and all other terms and provisions contained in this Agreement shall remain in full force and effect, and the Parties shall work together in good faith to amend, modify, or replace the relevant term or provision in accordance with the intent of the Parties as expressed in this Agreement.

4.4. Notices. All notices, requests, demands and other communications made under this Agreement shall be in writing and shall be deemed duly given if (i) hand delivered against a signed receipt therefor, (ii) sent by registered mail, return receipt requested, first class postage prepaid, or (iii) sent by internationally recognized overnight delivery service.

a. Notices to Petitioners pursuant to this Agreement shall be sent to:

Western States Petroleum Association:

Name:	Oyango Snell
Email:	osnell@wspa.org
Telephone:	(916) 325-3115
Address:	1415 L Street, Suite 600, Sacramento, CA 95814

Valero Refining Company—California:

Name:	Megan Bluntzer
Email:	Megan.Bluntzer@valero.com
Telephone:	(210) 345-4009
Address:	1 Valero Way, San Antonio, TX 78249

Tesoro Refining & Marketing Company, LLC:

Name:	Stoney Vining
Email:	Stoney.K.Vining@tsocorp.com
Telephone:	(210) 626-4122
Address:	19100 Ridgewood Pkwy , San Antonio, TX 78259

Phillips 66 Company:

Name:	Manager, San Francisco Refinery at Rodeo
Email:	N/A
Telephone:	(510) 245-4415
Address:	1380 San Pablo Avenue, Rodeo, CA 94572

With a copy to Beveridge & Diamond P.C.:

Name:	David McCray
Email:	dmccray@bdlaw.com
Telephone:	415.262.4025
Address:	456 Montgomery Street, Suite 1800, San Francisco, CA 94104

b. Notices to the District pursuant to this Agreement shall be sent to:

Name:	Adan Schwartz
Email:	aschwartz@baaqmd.gov
Telephone:	(415) 749-4920
Address:	375 Beale St., San Francisco, 94105

With a copy to:

Name:	Eric Stevenson
Email:	estevenson@baaqmd.gov
Telephone:	(415) 749-4695
Address:	375 Beale St., San Francisco, 94105

c. Either Party may alter that Party's contact information for purposes of notices, at any time, by giving notice of such change in conformity with the provisions of this Agreement.

d. Notice shall be deemed to be effective: if hand delivered, when delivered; if mailed, at midnight on the third (3rd) business day after being sent by registered mail; and if sent by internationally recognized overnight delivery service, on the next business day following delivery to such delivery service.

4.5. Governing Law; Venue. This Agreement shall be governed by and construed in accordance with the laws of California, without giving effect to any choice or conflict of law provision or rule (whether of the State of California or any other jurisdiction). Any action, proceeding or suit arising out of or based upon this Agreement shall be instituted in the Superior Court for the State of California for the County of Contra Costa.

4.6. Recitals. The Recitals set forth in this Agreement are a material part of this Agreement and are hereby expressly incorporated by reference as though expressly set forth herein.

4.7. Authority. Each Party hereby represents and warrants that it has full power and authority to enable, execute and deliver this Agreement and to perform its obligations hereunder. Each of the undersigned individuals represents and warrants that s/he has read and understands this Agreement and has full and complete lawful authority to bind the respective Party and any respective principals, successors, subsidiaries, partners, limited partners, agents and assigns to this Agreement.

4.8. Benefit and Burden. This Agreement is binding upon and shall inure to the benefit of the Parties, their respective beneficiaries, predecessors, successors, assigns, partners, partnerships, parent companies, subsidiaries, affiliated and related entities, officers, directors, principals, agents, servants, employees, representatives, and all persons, firms, petitioners, and/or persons or entities connected with each of them, including, without limitation, their insurers, sureties, attorneys, consultants, and experts.

4.9. Entire Agreement. This Agreement, including any Appendices hereto, constitutes the full, complete and final statement of Petitioners and the District on the matters addressed by this Agreement. The Parties acknowledge that this Agreement contains the entire understanding between the Parties with respect to the matters addressed by this Agreement. This Agreement expressly supersedes, voids, and terminates the entirety of the Interim Enforcement Agreement executed by the Parties on April 21, 2017 and amended on June 30, 2017.

4.10. Amendments in writing. This Agreement may be amended or modified only by a written instrument signed by authorized representatives of all Parties.

4.11. Waiver. Any waiver of any provision or term of this Agreement shall be effective only if in writing and signed by all Parties. The waiver of any provision or term of this Agreement shall not be deemed as a waiver of any other provision of this Agreement.

4.12. No Third-Party Beneficiaries. There are no third-party beneficiaries to this Agreement and nothing expressed, implied, or referred to in this Agreement will be construed to give any Person, other than the Parties to this Agreement, any legal or equitable right, remedy, or claim under or with respect to this Agreement or any provision of this Agreement, except such rights as may inure to the Parties' predecessors, successors, subsidiaries, or other persons or entities, in accordance with Section 4.8.

4.13. Further Cooperation. The Parties shall cooperate and promptly execute any and all documents and perform any and all acts necessary to effectuate the provisions of this Agreement.

4.14. No Admission. This Agreement resulted from a compromise of disputed claims and is not to be construed as an admission by either Party nor as acknowledgement that any of the claims and responses were correct or incorrect.


4.15. Effective Date. The Effective Date of this Agreement shall be the last date of execution of the Agreement.

4.16. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall have the same force and effect as an original, but all of which together shall constitute one and the same instrument.

[Signature page(s) follow]

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:


**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

BY: 
NAME: _____

TITLE: _____

DATED: 2/27/18

APPROVED AS TO LEGAL FORM


**BRIAN C. BUNGER
DISTRICT COUNSEL
BAY AREA AQMD**

**WESTERN STATES PETROLEUM
ASSOCIATION**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**VALERO REFINING COMPANY—
CALIFORNIA**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

PHILLIPS 66 COMPANY

BY: _____

NAME: _____

TITLE: _____

DATED: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**WESTERN STATES PETROLEUM
ASSOCIATION**

BY: Oyango A. Snell

NAME: Oyango A. Snell (802878)

TITLE: General Counsel (Registered In-house)

DATED: 2/28/2018

**VALERO REFINING COMPANY—
CALIFORNIA**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

PHILLIPS 66 COMPANY

BY: _____

NAME: _____

TITLE: _____

DATED: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**WESTERN STATES PETROLEUM
ASSOCIATION**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**VALERO REFINING COMPANY—
CALIFORNIA**

BY: Donald C. Wilson *MDP*

NAME: DONALD C. WILSON

TITLE: VP & GM

DATED: 2-26-18

**TESORO REFINING & MARKETING
COMPANY, LLC**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

PHILLIPS 66 COMPANY

BY: _____

NAME: _____

TITLE: _____

DATED: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**WESTERN STATES PETROLEUM
ASSOCIATION**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**VALERO REFINING COMPANY—
CALIFORNIA**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

BY: Thomas A. Lu

NAME: Thomas A. Lu

TITLE: VP, Martinez Refinery

DATED: 2/26/2018

PHILLIPS 66 COMPANY

BY: _____

NAME: _____

TITLE: _____

DATED: _____

IN WITNESS WHEREOF, this Agreement has been executed by each of the Parties as of the date set forth beneath such Party's authorized representative's signature:

**BAY AREA AIR QUALITY
MANAGEMENT DISTRICT**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**WESTERN STATES PETROLEUM
ASSOCIATION**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**VALERO REFINING COMPANY—
CALIFORNIA**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

**TESORO REFINING & MARKETING
COMPANY, LLC**

BY: _____

NAME: _____

TITLE: _____

DATED: _____

PHILLIPS 66 COMPANY

BY:  _____

NAME: MARK EVANS

TITLE: REFINERY MANAGER

DATED: 3/1/2018

APPENDIX A

Rule 12-15 Modifications

The following provisions of Rule 12-15 shall be proposed to be modified in accordance with the redline version below, in which (1) red text indicates language that shall be added (**example of new text**) to the relevant provision for purpose of this Agreement and for purposes of enforcement against Petitioners and, (2) strikethrough text indicates language that shall be removed (~~example of removed text~~) from the relevant provision for purpose of this Agreement and for purposes of enforcement against Petitioners. Comments on the redline version, which are considered terms of this Agreement, are indicated in green text (**example of comment text**). The District may propose the textual changes in this Agreement or alternative textual changes with the equivalent effect:

- a. 12-15-205: Crude Oil/**Crude Oil Blends: Unblended crude oil or blended crude oil at the first stage of processing at a Petroleum Refinery (typically at a crude distillation unit).**
~~Petroleum, as it occurs after being extracted from geologic formations by an oil well, and after extraneous substances may have been removed, and which may be subsequently processed at a Petroleum Refinery.~~

- b. 12-15-206: Emissions Inventory: **For purposes of this regulation, an emissions inventory is Aa comprehensive and accurate** accounting of the types and quantities of criteria pollutants, toxic air contaminants, and greenhouse gases that are released into the atmosphere based on **current** ~~state-of-the-art~~ measurement technologies and estimation methodologies. **It is intended to represent the actual emissions to the best precision possible based on those measurement technologies and estimation methodologies.** For the purposes of this rule, emissions inventory data **is data that is** ~~shall be~~ collected or calculated **by the Petroleum Refinery** for: ~~(1) all continuous, intermittent, predictable, and accidental air releases resulting from Petroleum Refinery processes at stationary sources at a Petroleum Refinery;~~ and ~~(2) air releases from cargo carriers (e.g., ships and trains), excluding motor vehicles, during loading or unloading operations at a Petroleum Refinery.~~

12-15-209: Monthly Crude Slate Report: Summaries of the volume and certain properties of crude oil ~~or~~ **crude oil blends at the first stage of processing at a Petroleum Refinery (typically at a crude distillation unit) and of the volume and certain properties of non-crude oil feedstock or feedstock blends which have been imported from outside a Petroleum Refinery, at the point it is first introduced into any refinery processing equipment other than storage, product blending, loading or unloading. The ~~crude oil~~ summary shall consist of the total volume of crude oil/**crude oil blends processed in the calendar month, and single average value for each of the properties of the total volume of -crude oil/ crude oil blends processed for the calendar month, as listed in Section 12-15-408, Table 1.** **The non-crude oil feedstock summary shall consist of the total volume and certain properties of non-crude oil feedstock/non-crude oil feedstock blends that are non-gaseous at Standard Temperature and Pressure fed to a fluidized catalyst processing unit. On a calendar month basis, the Petroleum Refinery shall document the volume of all imported feedstocks to a fluidized catalyst process unit. The Petroleum Refinery will provide a single averaged representative value for the imported feedstock to a fluidized****

catalyst for API, sulfur, iron, nickel, and vanadium if total imported feedstocks exceed one of the following conditions in the calendar month:

1. The volume of all imported feedstocks with an API equal to or greater than 15 is greater than 20 percent of the annualized daily limit listed within a Title V permit multiplied by 30;
or
2. The volume of all imported feedstocks with an API less than 15 is greater than 50,000 bbls.

Within 5 years after execution of this Agreement, the District will reconsider whether the requirement for the non-crude oil feedstock summary is justified based on the frequency of events that require sampling. The District will propose removing this requirement unless it finds that the frequency of sampled events justifies its continuation. The District will consult with Petitioners prior to reaching a decision. Additionally based upon the five year monitoring results, an owner or operator of a Petroleum Refinery may request that this provision terminate with respect to that Petroleum Refinery and, in the District's sole discretion, the provision will terminate as to the specific Petroleum Refinery. The owner or operator of the Petroleum Refinery must submit the request in writing. The District must grant or deny the request within 30 days of receipt of the request. If the District fails to deny the request within 30 days, such failure will be deemed approval and the provision will sunset immediately with respect to that Petroleum Refinery.

~~Supporting information for each crude oil and each non-crude oil feedstock~~ data maintained by a Petroleum Refinery shall be made available for inspection and audit by the APCO at the Petroleum Refinery ~~audit~~ upon request in order to verify the summary data required in Section 12-15-408, Table 1. To ensure the protection of Confidential Information and prevent its inadvertent release, the District agrees to not remove the data described in this paragraph from the Petroleum Refinery or copy any source information or supporting data as described above. The District further agrees to use the supporting data only to verify the monthly cumulative statistical analysis of the summarized information found in Table 1. If the District creates its own notes based on review of the supporting data, it will ensure that its notes will not depict the supporting data in any form or manner such that a third party could deduce or reconstruct the supporting data (sometimes colloquially referred to as “reverse-engineering”). If the District finds a discrepancy between the monthly reports and supporting data, the District shall allow the Petroleum Refinery a reasonable opportunity to correct the discrepancy. If the discrepancy is not corrected, the District may use its notes (which are and shall be treated as confidential) and previous notification to correct the discrepancy as needed to document non-compliance with this Rule. The District will treat its notes as Confidential Information unless and until the source of the information affirmatively and in writing indicates to the District that the information contained in the notes is no longer Confidential Information (or a court of competent jurisdiction issues a final judgment ordering release of the information).

- c. **12-15-401 Annual Emissions Inventory:** A Petroleum Refinery or Support Facility owner/operator shall obtain and maintain APCO approval of an Annual Emissions

Inventory. Timely submittal as described in the next sentence shall constitute compliance with this requirement unless and until there is a determination of disapproval by the APCO pursuant to Section 12-15-402. On or before June 30, 2017, and every subsequent June 30, a Petroleum Refinery or Support Facility owner/operator shall submit to the APCO an Annual Emissions Inventory covering the previous calendar year period in an APCO-approved format. As described in the foregoing Agreement, the Parties have agreed to conduct, and are currently conducting, the Heavy Liquids Study. Pending the Heavy Liquids Study results, the Parties agree to utilize the emission factors in the table below for the calculation of the emissions from Heavy Liquid components [for all District purposes, including but not limited to, emissions permit fees and rule-making] until the Heavy Liquids Study is completed and new Bay Area refinery emissions factors are developed. The emission factors below are taken from the California Air Pollution Control Officers Association (“CAPCOA”) correlation equations and shall be applied to the HL components whose emissions were estimated in the EPA 114 request.

Heavy Liquid Component type	Equation	Reg 8-18 Leak Threshold (ppm)	Emission Factor (kg/hr/comp)
Valves	$2.27E-06(SV)^{0.747}$	100	7.08E-05
Pumps (Other than Steam Quench Seal)	$5.07E-05(SV)^{0.622}$	500	2.42E-03
Pumps-Steam Quench Seal	N/A	N/A	2.10E-02
Others	$8.69E-06(SV)^{0.642}$	100	1.67E-04
Connectors	$1.53E-06(SV)^{0.736}$	100	4.54E-05
Flanges	$4.53E-06(SV)^{0.706}$	100	1.17E-04
Open Ended Lines	$1.90E-06(SV)^{0.724}$	100	5.33E-05
Others - Pressure Relief Device *	$8.69E-06(SV)^{0.642}$	500	4.70E-04

Source: TABLE IV-3a: CAPCOA-REVISED 1995 EPA CORRELATION EQUATIONS AND FACTORS FOR REFINERIES AND MARKETING TERMINALS
 California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon leaks at Petroleum Facilities, CAPCOA, February 1999.

d. 12-15-401.2: A summary of the total quantity of each criteria pollutant, TAC, and GHG that was emitted from the Petroleum Refinery or Support Facility during the Annual Emission Inventory period, including a table for each source and each pollutant listing whether the pollutant was (a) continuously monitored, (b) monitored by direct measurement, (c) not monitored and estimated by some other method, or (d) not monitored and estimated to be zero. For those Petroleum Refineries using a “common pipe” calculation method for GHGs based on the fuel gas system configuration, the Parties have agreed to the following approach:

1. Identify the total GHG emissions associated with the common pipe sources.
2. Identify in the summary all common pipe sources.
3. Prorate the total GHG emissions to each source based on that source’s actual fuel consumed.

4. The calculation will conclude and be deemed sufficient when 95% or more of the total GHG emissions associated with the common pipe sources are allocated.
- e. **402.1 Preliminary Review:** Within 45 days of receipt of the report, the APCO will complete a preliminary review of the report to identify any deficiencies that need to be corrected. If the APCO determines that the submitted report ~~is deficient~~ **does not meet the requirements of Rule 12-15**, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination and the required corrective action. The APCO shall provide the owner/operator with the opportunity to meet and confer to discuss any objections to the APCO's preliminary determinations before they become final. If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the report, the Preliminary Review shall be deemed complete.
- f. **402.3 APCO Action:** Within 45 days of the completion of preliminary review, or of resubmittal of a corrected report, the APCO will approve the report if the APCO determines that the report meets the requirements of ~~this rule~~ **Rule 12-15**, and shall provide written notification to the owner/operator. This period may be extended **45 days** if necessary as determined by the APCO, **and such extension will be communicated to the applicable refinery prior to the completion of the 45-day period.** If the APCO determines that the report does not meet the requirements of ~~this rule~~ **Rule 12-15**, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination. Upon receipt of such notification, the owner/operator shall correct the identified deficiencies and resubmit the report within 45 days. If the APCO determines that the owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the owner/operator has failed to meet the requirements of this rule, and will disapprove the report, or the APCO may make the necessary corrections and approve the report with a designation that the report was approved with Air District revisions. **If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the corrected report, the Annual Emissions Inventory shall be deemed complete**
- g. **12-15-403:** The Parties agree with the language of this Section 12-15-403 as written, but agree to clarify the terms and application of Section 12-15-403 as follows: The Parties agree that the fence-line monitoring plan that is to be submitted on or before April 20, 2017, is a site-specific plan, and that the District will allow for a tailored implementation date for each Petroleum Refinery, both for initial plans and for any revisions to such plans that may be appropriate following revisions to the guidelines described in Section 12-15-406. The District will propose revisions to Rule 12-15 that incorporate this stated intent into the rule. The District acknowledges that the timing of implementation for a fence-line monitoring plan may be affected by factors beyond the refinery's control. The District's intent is to allow sufficient time to complete the design, permitting, sourcing, installation, testing, and start-up of fence-line monitoring systems, taking into account potential delays that are explained and supported in the related site-specific plan. An example would be a compliance date that accounts for the time expected to obtain a permit from a local agency, or time necessary to obtain the required monitoring equipment from a vendor.

- h. **12-15-404.1: Preliminary Review:** Within 45 days of receipt of the air monitoring plan, the APCO will complete a preliminary review of the plan to identify any deficiencies that need to be corrected. If the APCO determines that the submitted plan is deficient, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination and the required corrective action. **If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the air monitoring plan, the Preliminary Review shall be deemed complete.**
- i. **12-15-404.4: Final Action:** Within 45 days of the close of the public comment period under Section 12-15-404.3, the APCO will approve the air monitoring plan if the APCO determines that the plan meets the requirements of Section 12-15-403, and shall provide written notification to the owner/operator. This period may be extended **45 days** if necessary as determined by the APCO. If the APCO determines that the plan does not meet the requirements of Section 12-15-403, the APCO will notify the owner/operator in writing. The notification will specify the basis for this determination. Upon receipt of such notification, the owner/operator shall correct the identified deficiencies and resubmit the air monitoring plan within 45 days. If the APCO determines that the owner/operator failed to correct any deficiency identified in the notification, the APCO will determine that the owner/operator has failed to meet the requirements of Sections 12-15-403 and will disapprove the plan. **If a notification containing specific deficiencies is not sent by the APCO to the owner/operator within 45 days after the APCO's receipt of the corrected air monitoring plan, the air monitoring plan shall be deemed complete.**
- j. **12-15-405: Emissions Inventory Guidelines:** The APCO shall publish, and periodically update, emissions inventory guidelines describing best practices to be used when **calculating emissions required to be reported in accordance with Rule 12-15** ~~producing emissions inventories required under this rule~~. Emission factors and **emission** estimation methodologies included in these guidelines may include, but are not limited to, continuous monitoring to measure emissions, applying the results of emissions source tests to known activity levels, combining published emission factors with known activity levels, material balances, or empirical formulae. **The District shall request comments from affected facilities at least 60 days in advance of making changes to the Emissions Inventory Guidelines. The District shall respond to comments received. Affected facilities shall be allowed at least 90 days to implement the changes in the Emissions Inventory Guidelines. The District will use these guidelines as criteria to determine whether for a of Petroleum Refinery and Support Facility emissions inventory meets the requirements of submittals Rule 12-15.**
- k. **12-15-406: Air Monitoring Guidelines:** The APCO shall publish air monitoring guidelines for Petroleum Refineries that describe the factors that the District will apply in reviewing fence-line monitoring systems required under this rule. These guidelines may include, but are not limited to, specifications for pollutant coverage, siting, instrumentation, operation, maintenance, quality assurance, quality control, and data reporting. The guidelines shall be reviewed by the APCO within five years of initial issuance in consideration of advances in air monitoring technology, updated information regarding the health effects of air pollutants, and review of data collected by existing fence-line air monitoring systems established under

this rule. The District shall request comments from affected facilities at least 60 days in advance of making changes to the Air Monitoring Guidelines. The District shall respond to comments received.

- l. 12-15-407: **Designation of Confidential Information:** Except as stated in 12-15-209 and 12-15-408, when ~~submitting~~ providing any documents or records required by this rule to the District, the Petroleum Refinery or Support Facility owner/operator shall designate as confidential any information claimed to be exempt from public disclosure under the California Public Records Act, Government Code Section 6250 et seq. ~~If a document is submitted that contains information designated confidential in accordance with this section, the owner/operator shall provide a justification for this designation and shall submit a separate copy of the document with the information designated confidential redacted.~~

- m. 12-15-408.

408.1 Historical Monthly Crude Slate Reports: For each-month of the years 2013, 2014, 2015 and 2016, summarized information as described in Table 1 to the extent ~~such this~~ information is available based on the records maintained in the normal course of business. Detailed supporting data, based on records maintained by the Petroleum Refinery in the normal course of business, shall be made available at the Petroleum Refinery upon APCO request for verification of the monthly-summaries described in 12-15-209, effective April 20, 2017. For the purposes of this Agreement, to ensure the protection of Confidential Information and prevent its inadvertent release, the District will not remove or make copies of the detailed supporting data. Further, the District agrees that it shall use the supporting data only to verify the monthly cumulative statistical analysis of the summarized information found in Table 1. If the District creates its own notes based on review of the supporting data, it will ensure that its notes will not depict the supporting data in any form or manner such that a third party could deduce or reconstruct the supporting data (sometimes colloquially referred to as “reverse-engineering”). If the District finds a discrepancy between the monthly reports and supporting data, the District shall allow the Petroleum Refinery a reasonable opportunity to correct the discrepancy. If the discrepancy is not corrected, the District may use its notes and previous notification to correct the discrepancy (which are and shall be treated as confidential) as needed to document non-compliance with this Rule. The District will treat its notes and information it generates as Confidential Information unless and until the source of the information affirmatively and in writing indicates to the District that the information contained in the notes is no longer Confidential Information (or a court of competent jurisdiction issues a final judgment ordering release of the information).

408.2 Ongoing Monthly Crude Slate Reports: Beginning with January 2017, summarized information as described in Table 1. Detailed supporting data, based on records maintained by the Petroleum Refinery shall be made available at the Petroleum Refinery upon APCO request for verification of the monthly summaries, no later than 30 days after the end of each calendar month. For the purposes of this Agreement, to ensure the protection of Confidential Information, the District agrees to

not remove the data from the Refinery or make any type of copies of the source information. The District agrees that any information it generates and takes possession of during its review of this detailed supporting data will not reveal data capable of being “reversed-engineered.” The District agrees to treat any such information that it generates as Confidential Information unless and until the Petitioner for which the information is gathered indicates otherwise.

Table 1 shall be amended as follows:

Table 1- Summarized Information Required in Monthly Crude Slate Report
<p>Processed Volume (thousand barrels)</p> <p>a. Total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Total volume of non-crude oil feedstock/non-crude oil feedstock blends as defined in Section 12-15-209.</p>
<p>API gravity (degrees)</p> <p>a. Average API gravity of total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Average API gravity of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units as defined in Section 12-15-209.</p>
<p>Sulfur content (weight percent)</p> <p>a. Average sulfur content of total volume of crude oils / crude oil blends as fed to all crude units.</p> <p>b. Average sulfur content of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units as defined in Section 12-15-209.</p>
<p>Vapor pressure (psia)</p> <p>a. Average vapor pressure of total volume of crude oils / crude oil blends fed to all crude units.</p> <p>b. Average vapor pressure of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units.</p>
<p>BTEX (benzene, toluene, ethylbenzene, and xylene content in volume percent)</p> <p>a. Average BTEX of total volume of crude oils / crude oil blends fed to all crude units.</p> <p>b. Average BTEX of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units.</p>

Metals (iron, nickel and vanadium content in ppmw)

- a. Average metals content of total volume of crude oils / crude oil blends fed to all crude units.
- b. Average metals content of total volume of non-crude oil feedstocks / feedstock blends fed to all other process units **as defined in Section 12-15-209.**

- n. **12-15-501: Fence-line Monitoring System:** ~~Within one year of the approval of an air monitoring plan under Section 12-15-404,~~ **Once the fence-line monitoring system is installed and operational pursuant to Section 12-15-403,** the Petroleum Refinery owner/operator will ensure that ~~a~~ **the** fence-line monitoring system ~~is installed,~~ **and** is operated in accordance with the approved air monitoring plan. Fence-line monitoring system data shall also be reported as specified in the approved plan.

Appendix C: Cooling Tower Hydrocarbon Emissions Estimates

Objective:

Calculate potential impacts on ROG emissions and associated cost impacts (i.e. cost effectiveness) for the draft amendments to Rule 11-10.

- Estimated emissions and emissions impacts of draft amendments to Rule 11-10 require a probabilistic assessment of future heat exchange leaks into cooling water systems, as the occurrence of leaks is speculative due to their variable nature. In addition, draft amendments to Rule 11-10 include further monitoring period extensions if the cooling tower demonstrates consistently that it has no leaking heat exchangers. This provision complicates the probabilistic assessment, because the timing of a future leak can impact the number of weeks monitored at a normal frequency and the number of weeks monitored at an extended frequency.
- Estimate impacts on emissions for more frequent monitoring. Maximum Achievable Control Technology (EPA 40 CFR 63.654) study estimated emissions for no monitoring, annual, quarterly, and monthly monitoring.
- Three different approaches are used to estimate average annual emissions (via emission factors) for monthly, twice-monthly, weekly and daily monitoring.

In addition, the current Rule 11-10 requires quicker response to cooling tower leaks than the MACT required by limiting repair time to 21 days, rather than 45 days as provided in the MACT analysis. Estimated emissions are adjusted to include this difference in repair periods, as described below.

Basis for Estimated Emission Reductions – Current Rule 11-10 (as adopted):

Estimated emission reductions included in the Staff Report for Rule 11-10 as adopted in December 2015 were based on MACT-defined Emission Factors (EF):

- No monitoring EF = 6.0 lb ROG/Million gallons water circulation
- Monthly monitoring EF = 0.7 lb ROG/Million gallons water circulation

During the Rule 11-10 rule development process, staff used the MACT emission factor of 6.0 lb ROG per million gallons of circulating water for the “no monitoring” base case, and the improved emission factor of 0.7 lb ROG per million gallons of circulating water for the “active monitoring” case to estimate emission reductions. This approach resulted in emission estimates as follows:

$$\begin{aligned} \text{Baseline emissions} &= 978 \text{ tpy} & \text{Final estimated emissions} &= 117 \text{ tpy} \\ \text{Emission reductions} &= 978 \times (6.0 - 0.7)/6.0 = 978 \times 0.88 = 861 \text{ tpy} \end{aligned}$$

Note that the MACT emission factor used for the “active monitoring” case represents a monthly monitoring schedule. Rule 11-10 (as adopted) requires daily monitoring, however, staff did not estimate any further reduction in emissions from monitoring more frequently than monthly. Rule

11-10 also requires that leaks be repaired within 21 days, which is a shorter repair period than that required by the MACT (45 days); staff also did not estimate any further reduction in emissions from this shorter repair period of 21 days.

Updated Estimate of Emission Reductions – Current Rule 11-10 (as adopted):

Staff has identified appropriate emission factors for weekly and daily monitoring to update the estimates of emission reductions associated with Rule 11-10 (as adopted).

These emission factors are based on information provided by EPA’s staff work during development of the MACT, as described above. Air District staff used three different methods to extrapolate emission factors from monthly to more frequent monitoring periods:

1. Method 1: Use the “no monitoring” EF (6.0 lb ROG/M gallons of cooling tower recirculating water) and “monthly monitoring” EF (0.7 lb ROG/M gallons) to back calculate the likely leak magnitude and frequency of a “typical” cooling tower.
2. Method 2: Extrapolate directly (linear extrapolation) from the “no monitoring” EF through “monthly monitoring” EF to derive EFs for twice-monthly, weekly, and daily monitoring.
3. Method 3: Extrapolate directly (linear extrapolation) from the EFs for annual, quarterly, and monthly monitoring periods. The staff report supporting the MACT development from RTI International to EPA provided leak rate and emission reduction estimates for annual, quarterly, and monthly monitoring periods. This information provided the basis for extrapolating estimated emission factors for twice-monthly, weekly, and daily monitoring.

Staff used all three of these methods to develop estimated emission factors for more frequent monitoring. These methods are documented at the end of this appendix. Staff also developed an EF adjustment to account for the reduced repair period from 45 days to 21 days, resulting in a consistent reduction in emission factor of 0.207 lb/M gallons for all three methods used to estimate emission factors. This adjustment is shown in the calculations for Method 1 Emission Factors at the end of this appendix.

Table 4-1 shows the summary of estimated emission factors:

Table 4-1: Estimated Emission Factors for other monitoring periods:

Monitoring Period (days)	Repair Period (days)	MACT Emission Factors (lb/M gal)	Method 1 Emission Factors (lb/M gal)	Method 2 Emission Factors (lb/M gal)	Method 3 Emission Factors (lb/M gal)
None	45	6.0			
30	45	0.7	0.7	0.7	0.7
15	45		0.577	0.655	0.692
7	45		0.511	0.631	0.688
1	45		0.462	0.613	0.684
30	21		0.493	0.493	0.493
15	21		0.370	0.448	0.485
7	21		0.304	0.424	0.481
1	21		0.255	0.406	0.477

Updated estimates of emissions and emission reductions from Rule 11-10 (as adopted) depend on the emission factors used for weekly and daily monitoring.

Current Rule 11-10 requires cooling tower monitoring as follows:

- < 500 gpm cooling towers: monitor every other week
- < 2,500 gpm cooling towers: monitor weekly
- > 2,500 gpm cooling towers: monitor continuously, or daily

Applying the emission factors shown in Table 4-1 to the population of cooling towers in the Bay Area, updated estimates of the emissions and emission reductions from Rule 11-10 (as adopted) were calculated and are shown in Table 4-2. As shown, estimates of emission reductions from current Rule 11-10 range from 861 tons per year to 930 tons per year.

Table 4-2: Updated Estimated Emissions and Emission Reductions – Current Rule 11-10 (as adopted):

Estimated Emissions Impact	Baseline Emissions (tpy)	MACT Emission Factors (tpy)	Method 1 Emission Factors (tpy)	Method 2 Emission Factors (tpy)	Method 3 Emission Factors (tpy)
Baseline Emissions	978	-	-	-	-
Controlled Emissions (Current Rule 11-10 – as adopted)		117	48	76	90
Emission Reductions		861	930	902	888

Estimated Emission Impacts Associated with Draft Amendments to Rule 11-10:

Estimated emission impacts associated with the draft amendments to Rule 11-10 also depend on the emission factors used for twice-monthly, weekly, and daily monitoring.

Draft amendments to Rule 11-10 require cooling tower monitoring as follows:

- < 500 gpm cooling towers: monitor weekly, monthly after 4 successful weekly samples
- < 2,500 gpm cooling towers: monitor weekly, monthly after 4 successful weekly samples
- > 2,500 gpm cooling towers: monitor weekly, twice-monthly after 26 successful weekly samples

Estimated annual average emission factors are based on the following monitoring schedule assumptions for base monitoring and extended monitoring frequencies:

- < 500 gpm cooling towers:
 - 6 weeks of weekly monitoring
 - 46 weeks of monthly monitoring
- < 2,500 gpm cooling towers:
 - 6 weeks of weekly monitoring
 - 46 weeks of monthly monitoring
- > 2,500 gpm cooling towers:
 - 27 weeks of weekly monitoring
 - 25 weeks of twice-monthly monitoring

Applying the emission factors shown in Table 4-1 to the population of cooling towers in the Bay Area, estimates of the emissions and emission impacts from the draft amendments to Rule 11-10 were calculated and are shown in Table 4-3.

Table 4-3: Estimated Emissions and Emission Reductions – Draft Amendments to Rule 11-10:

Estimated Emissions Impact	Baseline Emissions (tpy)	MACT Emission Factors (tpy)	Method 1 Emission Factors (tpy)	Method 2 Emission Factors (tpy)	Method 3 Emission Factors (tpy)
Baseline Emissions					
Baseline Emissions	978	-	-	-	-
Current Rule 11-10 (as adopted)					
Controlled Emissions		117	48	76	90
Emission Reductions		861	930	902	888
Costs		\$2,187,350	\$2,187,350	\$2,187,350	\$2,187,350
Draft Amendments to Rule 11-10					
Controlled Emissions			64	82	91
Emission Reductions			-16	-6	-1
Costs			\$506,600	\$506,600	\$506,600
Cost Impacts ¹			-\$1,680,750	-\$1,680,750	-\$1,680,750
Cost Effectiveness			\$110,000	\$300,000	\$1,600,000

Notes:

¹ Cost impacts that are negative represent a cost savings due to reduced monitoring (as compared to monitoring required by current Rule 11-10).

Potential Foregone Emission Reductions:

Staff used three methods to define the range of sensitivity cases to estimate emissions impacts and costs impacts. Reduced frequency of monitoring cooling towers can theoretically allow an increase in ROG emissions (i.e. foregone emission reductions). Using the three methods, estimates of foregone emission reductions range from 1 ton per year to 16 tons per year, with the greatest impact on emissions estimated using Emission Factors from Method 1.

Staff also calculated the cost effectiveness of the draft amendments using the three methods. Using the foregone emission reduction estimates and the estimated cost savings of \$1,680,750 from reduced monitoring associated with the draft amendments, estimates of cost effectiveness ranged from \$110,000 to \$1.6 million dollars of savings per ton of theoretical foregone emission reductions. Since the range of cost effectiveness savings are significant and beyond normal cost effectiveness thresholds, the draft amendments to Rule 11-10 are supported by the cost-benefits analysis.

Alternatives for draft amendments to Rule 11-10 – estimated impacts on emissions and costs:

Alternatives:

1. Do not extend monitoring period from weekly to monthly after 4 weeks below the leak threshold for cooling towers smaller than 2,500 gpm
2. Do not extend monitoring period from weekly to twice-monthly after 26 weeks below the leak threshold for cooling towers larger than 2,500 gpm

Table 4-4: Estimated Emissions and Emission Reductions – Alternatives to Draft Amendments to Rule 11-10:

Estimated Emissions Impact	Method 1 Emission Factors (tpy)	Method 2 Emission Factors (tpy)	Method 3 Emission Factors (tpy)
Draft Amendments to Rule 11-10			
Controlled Emissions	64	82	91
Costs	\$506,600	\$506,600	\$506,600
Alternate 1: No extension of monitoring period for CWT < 2,500 gpm			
Controlled Emissions	63.5	81.8	90.9
Emission Reductions	0.5	0.2	0.1
Costs	\$558,350	\$558,350	\$558,350
Cost Impacts	\$51,750	\$51,750	\$51,750
Cost Effectiveness	\$100,000	\$250,000	\$500,000+
Alternate 2: No extension of monitoring period for CWT > 2,500 gpm			
Controlled Emissions	57.9	79.7	90.6
Emission Reductions	6.1	2.3	0.4
Costs	\$569,100	\$569,100	\$569,100
Cost Impacts	\$62,500	\$62,500	\$62,500
Cost Effectiveness	\$10,200	\$27,200	\$156,000

Alternatives to extending monitoring period:

Extending the monitoring period is appropriate for the small (< 2,500 gpm) cooling towers. Eliminating the extension of the monitoring period from weekly to monthly results in an emission reduction estimated to be 0.1 – 0.5 tons per year, but increases monitoring costs by \$51,750 annually. Cost effectiveness for eliminating the extension of the monitoring period ranges from \$100,000 - \$500,000 per ton of emission reductions, and it not justified.

Eliminating the extension of the monitoring period for large (> 2,500 gpm) cooling towers from weekly to twice monthly is less clear. Eliminating the extension of the monitoring period from weekly to twice-monthly for roughly half of each year results in an emission reduction estimated to be 0.4 – 6.1 tons per year but increases monitoring costs by \$62,500 annually. Cost effectiveness for eliminating the extension of the monitoring period ranges from:

- \$10,200 per ton of foregone emission reductions when using Estimated Emission Factors 1,
- \$27,200 per ton of foregone emission reductions when using Estimated Emission Factors 2, and
- \$156,000 per ton of foregone emission reductions when using Estimated Emission Factors 3.

Staff used three methods to define the range of sensitivity cases to estimate emissions impacts, and costs impacts. The greatest impact on costs is identified using Estimated Emission Factors 3. Based on the highest cost impact of \$156,000 per ton of emission reductions, eliminating the extension of the monitoring period is not justified.

Method 1 Emission Factors:

Assume no more than 1 leak into each cooling tower each year (reasonable assumption)

Use MACT basis (above) to extrapolate emission factors for more frequent monitoring:

- X days leaking each year before leak discovered by other factors
- 365-X days not leaking
- $(6.0 \times X \text{ days}) + ((365-X) \times 0) = 365 \times 0.7$
- X = 42.6 days leaking each year

Monitoring period = 30 days.

- On average, will detect leak on 15th day, confirm with sample on 16th day.
- 16 days to identify leak: $42.6 - 16 = 26.6$ days to repair leak (59% of 45-day repair period provided in MACT requirements)

Method 1 Emission Factors:

Monitoring Period	Average time to ID leak	Time for lab analysis	Repair time	Total Leak period	Emission Factor
days	days	days	days	days	lb/M gal.
None					6.0
30	15	1	26.6	42.6	0.7
15	7.5	1	26.6	35.1	0.577
7	3.5	1	26.6	31.1	0.511
1	0.5	1	26.6	28.1	0.462

However, Rule 11-10 included a 21-day repair period, or must notify APCO

- Estimated average repair time = 14 days (67% of repair period provided, slightly more than 59% of the 45-day repair period in the MACT because the timeframe is shorter)

Method 1 Emission Factors with 21-day repair period:

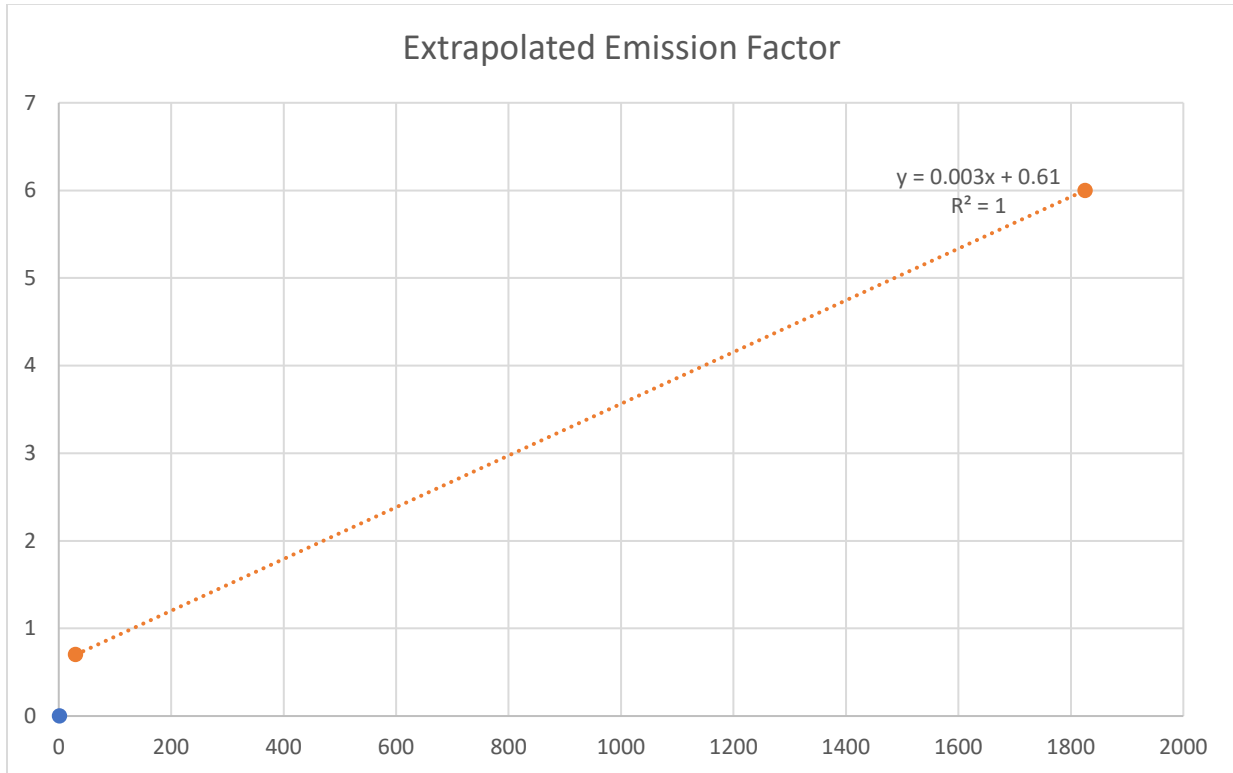
Monitoring Period	Average time to ID leak	Time for lab analysis	Repair time	Total Leak period	Emission Factor
days	days	days	days	days	lb/M gal.
30	15	1	14	30	0.493
15	7.5	1	14	22.5	0.370
7	3.5	1	14	18.5	0.304
1	0.5	1	14	15.5	0.255

Note – 21-day repair (14-day repair time) requirement reduces EF by 0.207 #/M gallons across all monitoring periods.

Method 2 Emission Factors:

Second Extrapolation of CWT emissions factors:

EF = 6.0 #/MM gallons with no monitoring, 0.7 #/MM gallons with monthly monitoring



Extrapolation		Monitoring Cycle - days	MACT	adj for 21-day repair EF2	
No Monitoring	6	1825 (~5 years)	6.0850		
Monthly	0.7	30	0.7000	0.207	0.493
Semi-monthly		15	0.6550	0.207	0.448
bi-weekly		14	0.6520	0.207	0.445
weekly		7	0.6310	0.207	0.424
daily		1	0.6130	0.207	0.406

Method 3 Emission Factors:

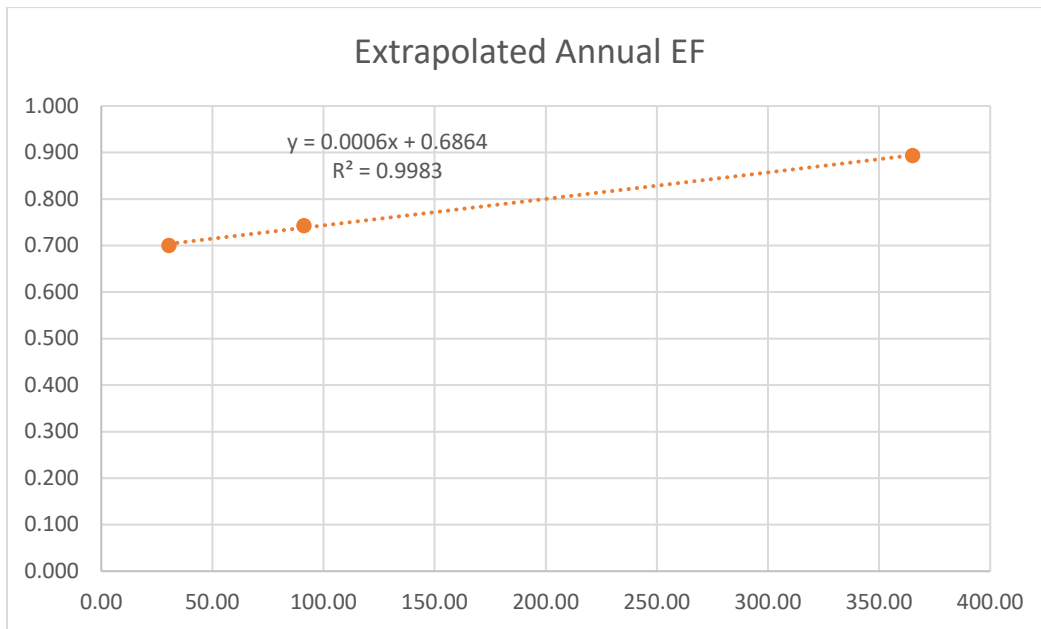
Third Extrapolation of CWT emissions factors:

MACT 40 CFR 63.654
 Memorandum: RTI International
 Jeff Coburn to Brenda Shine
 EPA Docket No. EPA-HQ-OAR-2011-0002
 July 12, 2011
 Technology Review for Heat Exchange Systems

Table 10. Detailed Results from Option Cost-Effectiveness Evaluation

110,000 gpm cooling tower: 40-day repair / 800 ppm threshold

- Annual EF = 0.893
- Quarterly EF = 0.743
- Monthly EF = 0.700



		check	adj for	
			21-day repair	
monthly	30	0.700	0.207	0.493
twice				
monthly	15	0.692	0.207	0.485
weekly	7	0.688	0.207	0.481
daily	1	0.684	0.207	0.477
		corrected by -.003 to		
		0.700		

APPENDIX D

Summary of Comments and Responses on Proposed Amendments to Rules 6-5, 11-10, and 12-15 and Staff Report

List of Commenters

Abbreviation	Commenter / Reference
West Marin Standing Together and 350 Bay Area	W. Ellen Sweet, West Marin Standing Together, and Richard Gray, 350 Bay Area, Letter, December 7, 2018

Comment 1.1: The current proposed revision of Rule 6-5 removes condensable particulate matter and sulfur dioxide from the list of pollutants intended for future FCCU control under this rule. This retraction is what the District agreed to do in the Enforcement Agreement/Agreement to Stay Litigation signed with Bay Area refineries in March 2017 without public scrutiny or accountability. We request that the Board reject the portion of this settlement concerning the above described changes to adopted Rule 6-5 and prepare to defend it in court for the protection of public health in the Bay Area and in furtherance of your missions.

West Marin Standing Together and 350 Bay Area

Response 1.1: The comment misstates the significance of the rule language that is proposed to be changed. Rule 6-5 Section 6-5-301 includes a “placeholder” provision for future emissions limits that may be adopted, the purpose of which was to alert readers to the Air District’s intent to address particulate matter from FCCUs in two phases (first focusing on ammonia injection optimization, and followed by examination and possible adoption of further control measures). This “placeholder” provision does not make the adoption of subsequent emissions limits more or less likely from either a legal or policy standpoint. At this point, the Air District believes the community and interested parties are sufficiently aware of this two-phase plan that a placeholder provision is no longer needed. The proposed amendments to Rule 6-5 consist of formatting changes and a clarification of original intent, and would not preclude the Air District from considering further amendments to make the rule more stringent in the future. The Air District has conducted the rule development process for these amendments with the proper public outreach, noticing, and technical analysis required under the Health and Safety Code. Furthermore, the Air District describes anticipated future rule development for FCCU emissions in the proposed AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule, which would evaluate ways to further address condensable PM emissions from FCCUs.

11800 Shoreline Highway
Point Reyes Station, CA 94956

December 7, 2018

BY ELECTRONIC MAIL

Board of Directors
Bay Area Air Quality Management District
c/o Marcy Hiratzka, Clerk of the Boards
375 Beale Street
San Francisco, CA 94105

RECEIVED

DEC 07 2018

CLERK OF
THE BOARDS

RE: December 19th Public Hearings on Proposed Rule Amendment 6-5 and BARCT Implementation

As concerned members of the communities you serve, we would like to call your attention to an ongoing situation that requires action on your part as members of the BAAQMD Board of Directors. This is an urgent matter of public health and welfare - the stated mission of the BAAQMD. On December 19th, 2018 the Board has scheduled Public Hearings on (I) Proposed Amendments to District Rules 6-5; and (II) on AB 617 Best Available Retrofit Control Technology (BARCT) Implementation Schedule.

(I) Proposed Amendments to Rule 6-5

For several years, leading California health professionals, scores of community and environmental protection advocates have been regularly attending meetings and providing comments and letters to the Air District Board, Technical Advisory Council, Stationary Source and Refinery Oversight Committee urging the District to do their job by requiring standard Best Available Control Technology (BACT) on refinery Fluidized Catalytic Cracking Units (FCCUs). Uncontrolled fine particulates from Bay area refineries have long impacted the air quality and health of surrounding communities, and indeed the Bay area at large. By requiring the use of wet scrubbing equipment under adopted Rule 6-5 – a proven technology already in use at the Valero Benecia refinery and at refineries around the country – emissions of PM_{2.5} (respirable) particulate could be reduced by greater than 95 percent. However, the current proposed revision of Rule 6-5 [Control Of Particulate Emissions from Refinery FCCUs] REMOVES condensable particulate matter (PM 2.5 and smaller) and sulfur dioxide (a precursor to particulate formation) from the list of pollutants intended for future FCCU control under this rule (Table 1). This retraction is what the District agreed to do in the "Enforcement Agreement/Agreement to Stay Litigation" signed with Bay area refineries in March 2017, without public scrutiny or accountability (see Article 3 on pages 4 and 5 of the Enforcement Agreement). We request that the Board reject the portion of this settlement concerning the above described changes to adopted Rule 6-5 and prepare to defend it in court for the protection of public health in the Bay Area and in furtherance of your mission.

(II) Proposed AB 617 BARCT Implementation Schedule

In the proposed BARCT Implementation Schedule refinery FCCUs are in one of the six categories to be evaluated for rule development, with a 2-year timeline (2019 to 2020). We believe that two more years of no control of FCCU PM_{2.5} emission is unacceptable, in light of the ongoing critical community health impacts of refinery particulate emissions. We request that emissions reductions from FCCUs begin immediately under adopted Rule 6-5 and not be delayed for another two years under the AB 617 BARCT Implementation Schedule.

It is our hope that, as BAAQMD Board members, you will firmly stand on the side of protecting public health and welfare from uncontrolled fine particulate pollution impacts.

Thank you for your consideration of these critical issues, now more urgent than ever as California (and countries around the world) struggles to meet air pollution reduction targets that are drastically affecting the earth's climate.

Sincerely,

W. Ellen Sweet
350Marin
West Marin Standing Together

Richard Gray
360 Bay Area



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

**Petroleum Refinery Emissions Reduction
Strategy:
Staff Report**

Prepared by the staff of the
Bay Area Air Quality Management District

December 2015

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Petroleum Refinery Emissions Reduction Strategy: Staff Report

I. EXECUTIVE SUMMARY

The Bay Area Air Quality Management District (Air District) has developed a strategy for addressing air pollution from Bay Area petroleum refineries. This strategy stems from a Board of Directors' resolution (2014-17) adopted in October 2014, in which the Board instructed staff to develop a regulatory strategy that would further reduce emissions from petroleum refineries, with a goal of an overall reduction of 20 percent (or as much as feasible) no later than 2020. The strategy targets a spectrum of criteria pollutants and/or their precursors, including reactive organic gases (ROG), particulate matter (PM), sulfur dioxide (SO₂), and oxides of nitrogen (NO_x).

The first set of these rules, designed to reduce harmful emissions, will be considered by the Board in December 2015 and is expected to reduce overall emissions from refineries by approximately 14 percent. This first set of rule actions would reduce smog-forming and toxic emissions from equipment leaks and cooling towers. These rules also would limit ammonia emissions from fluid catalytic cracking units (FCCUs), which will reduce associated formation and emission of fine particulate matter (PM_{2.5}).¹ In mid-2016, the second set of regulations will be developed to further reduce PM_{2.5} emissions from fluid catalytic cracking units (if needed) and SO₂. The second set of regulations also would reduce SO₂ from other refinery sources including coke calcining and would reduce smog-forming emissions from turbines. The development of these sets of regulations is also known as the Petroleum Refinery Emission Reduction Strategy.

Overview of Proposed Rules and Rule Amendments

In this first phase of the Petroleum Refinery Emission Reduction Strategy, staff has developed three regulatory proposals: one new rule, and amendments to two existing Air District rules.

- New rule, Rule 6-5: Fluidized Catalytic Cracking Unit (FCCU), to minimize PM_{2.5} emissions from FCCUs at three refineries;
- Amendments to Rule 8-18: Equipment Leaks, to address fugitive emissions of reactive organic gases (ROG) and toxic compounds from refinery equipment; and
- Amendments to Rule 11-10: Toxic and ROG emissions from Cooling Towers, to address emissions of ROG and toxic compounds from cooling towers.

These emissions reductions will make substantial progress toward achievement and maintenance of the state and federal ambient air quality standards.

¹ PM_{2.5} is the portion of particulate matter with an aerodynamic diameter of less than 2.5 micrometers.

II. BACKGROUND

The Petroleum Refinery Emissions Reduction Strategy is intended to reduce emissions of criteria pollutants and their precursors (SO₂, NO_x, PM_{2.5}, reactive organic gases (ROG)) and toxic compounds from the five Bay Area refineries and associated facilities. The Air District plans to accomplish these refinery emissions reductions by amending several Air District rules affecting petroleum refineries and developing additional rules aimed at specific refinery processes.

The Air District is moving these individual actions through the rulemaking process as a package. This enables the Air District to use its staff resources more efficiently, streamline coordination and consultation with the public and the regulated community and respond to requests by the public. There should be no inference that this approach creates dependencies between these rule actions. Each rulemaking action is independent from the others and will be individually evaluated and considered for adoption according to the requirements of the California Health and Safety Code (H&SC).

This report and the proposed regulatory language reflect the input of stakeholders as a result of the Request for Comment on the Initial Report released in May 2015, open houses conducted in refinery communities in September 2015, and publishing of the public hearing package for these regulatory items, and internal staff deliberations. Staff considered the input received in drafting the proposed rules and the final staff report. The proposed rules and final staff report will be presented to the Air District Board of Directors for their consideration at a public hearing on December 16, 2015.

Goals: On December 17, 2014, the Air District's Board of Directors approved the following overall goals for the Petroleum Refinery Emission Reduction Strategy:

1. Strive to achieve a 20 percent reduction in emissions of criteria pollutants and precursors in the next five years.
2. Strive to achieve an additional 20 percent reduction in health risk from the emission of toxic pollutants.

Criteria pollutants are pollutants for which federal or state air quality standards have been established, such as SO₂, ozone, and PM_{2.5}. Precursors are pollutants that interact in the atmosphere to form criteria pollutants. For example, NO_x and ROG when exposed to sunlight combine to form ozone, and SO₂ and NO_x react with ammonia in the atmosphere to form PM_{2.5}. Toxic pollutants (toxic air contaminants (TACs)) are compounds identified by the ARB as air pollutants that may cause or contribute to an increase in mortality or in serious illness or that may pose a present or potential hazard to human health.

A. Air Quality Standards and Attainment Status

The Air District is a nonattainment area for the California ozone, PM₁₀ and PM_{2.5} clean air standards and for the National ozone and PM_{2.5} standards.

Ozone

Ozone is the chemical name for what is generally known as photochemical smog. Exposure to ozone can trigger a variety of health problems including chest pain, coughing, throat and eye irritation and congestion. It can worsen bronchitis emphysema and asthma and, after repeated exposure may

permanently scar lung tissue. Ozone forms when nitrogen oxides (NO_x) and ROG react in the atmosphere, particularly when the weather is warm. Table 1 provides a summary of the number of times and locations the ozone standards have been exceeded in each of the last 5 years. This reflects the recent decision by the US Environmental Protection Agency (EPA) to strengthen the ozone standard to 0.070 part per million (ppm).

Table 1: Ozone Standards, and Exceedances²

Standard	Year	Exceedances	Locations
1 hour = 0.090 ppm	2010	26	13
	2011	6	3
	2012	5	4
	2013	3	1
	2014	3	1
8 hour = 0.070 ppm	2010	51	12
	2011	25	9
	2012	23	10
	2013	12	8
	2014	30	8

Particulate Matter

Particulate matter (particulates, PM) comes from natural sources (dust and sea salt), motor vehicles (mostly diesel soot), and industrial sources (catalyst emissions from refineries, black carbon from power plants). Particulates can also form in the air from reaction of ammonia with NO_x and sulfur oxides (SO_x). Particulates cause health impact because the smallest particles can penetrate deep into the lungs, causing damage to the lungs and creating breathing issues. The finest of these particles can penetrate through lung tissue into the bloodstream causing a variety of health issues, and are discussed below. Particulates are classified by size – the term Total Suspended Particulates (TSP) describes the entire range of particulate matter size. Particulates smaller than 10 microns are known as PM₁₀, and very fine particulates smaller than 2.5 microns are known as PM_{2.5} or fine particulate.

PM₁₀ Levels in the Bay Area

Table 2 provides a summary of the number of times and locations the PM₁₀ standards have been exceeded in each of the last 5 years.

Table 2: PM₁₀ Standards, and Exceedances³

Standard	Year	# of Times Exceeded	Locations
Annual = 20 µg/m ³	2011	1	Napa
	2013	1	San Jose
24 hour = 50 µg/m ³	2010	12	Bethel Island, San Rafael

² <http://www.arb.ca.gov/adam/select8/sc8display.php>

³ <http://www.arb.ca.gov/adam/select8/sc8display.php>

	2011	24	Concord, Napa, San Pablo, San Rafael
	2012	15	Bethel Island, San Francisco, San Jose
	2013	21	San Jose, San Rafael
	2014	3	San Jose

PM_{2.5} Levels in the Bay Area

PM_{2.5} can penetrate deeply into sensitive parts of the lungs and cause or worsen respiratory disease, such as emphysema and bronchitis, even for short exposure times. Fine particulates can also aggravate existing heart disease, leading to increased hospital admissions and premature death. The Air District continues to exceed the federal 24-hour standard of 35 µg/m³ several times per year. On these high concentration days, people, especially vulnerable and susceptible parts of the population, can experience health problems that affect their ability to go about daily activities normally.

Table 3 provides a summary of the number of times and locations the PM_{2.5} standards have been exceeded in each of the last 5 years.

Table 3: PM_{2.5} Standards, and Exceedances⁴

Standard	Year	# of Times Exceeded	Locations or number of locations
Annual = 12 µg/m ³	2013	1	Oakland
	2013	1	San Jose
Federal 24 hour standard* = 35 µg/m ³	2010	11	6
	2011	15	8
	2012	3	2
	2013	21	9
	2014	7	6

* The Federal PM_{2.5} standard is included here because California does not have a 24-hour PM_{2.5} standard. The federal PM_{2.5} air quality standard is 35 micrograms per cubic meter (µg/m³) measured on a 24-hour basis. Ambient measurements are used to calculate a statistic that is compared to these standards called a design value. The Air District's most recent 24-hour design value was 32 µg/m³. While the design values have been below the federal standards since 2010, 35 µg/m³ represents the daily limit beyond which significant health impacts may occur.

The Air District must continue to implement regulations to attain and maintain the California and/or federal clean air standards for ozone, PM₁₀ and PM_{2.5}.

B. Regulatory Context

The Air District is currently engaged in developing regulatory measures to reduce emissions of air pollutants from a wide variety of stationary and area sources. As part of the ongoing development of the Air District's 2016 Clean Air Plan, staff evaluated many of these sources and determined that due to

⁴ <http://www.arb.ca.gov/adam/select8/sc8display.php>

their high relative contribution to emissions, refineries and associated facilities should be a high priority for additional pollution control.

The 2012 Bay Area Emissions Inventory indicates that refineries are the largest individual stationary source emitters of anthropogenic ROG, NO_x and SO₂. And they are the largest individual source category for PM_{2.5} emissions. (See Table 4a) Their impact is even more significant in the counties where they are located. In Contra Costa and Solano counties, the refineries and their associated facilities emit 22 percent PM_{2.5}, 26 percent of anthropogenic ROG and over 90 percent of SO₂ (See Table 4b).

Table 4a: Bay Area Emissions of Relevant Pollutants by Source Category¹

Source Category	Emissions (tons/yr)							
	PM _{2.5}	%	Anthropogenic ROG	%	NO _x	%	SO ₂	%
Refineries	1,330	8%	5,178	5%	4,137	4%	3,009	42%
Coke Calcining	29	0.2%	0.2	0%	239	0.2%	1,242	17%
Cement Plant	23	0.1%	40	0.04%	2,170	2%	912	13%
Other Major Industrial	1,839	11%	17,640	18%	5,772	5%	581	8%
Residential/Commercial	5,519	34%	27,862	29%	5,531	5%	326	5%
Agricultural	471	3%	2,049	2%	0	0%	0	0%
Miscellaneous	986	6%	116	0.1%	10	0%	0	0%
Mobile Sources	5,945	37%	44,659	46%	91,473	83.7%	1,168	16%
Total Emissions	16,142	100%	97,543	100%	109,332	100%	7,237	100%

Table 4b: Emissions of Relevant Pollutants by Source Category for Contra Costa and Solano Counties¹

Source Category	Emissions (tons/yr)							
	PM _{2.5}	%	Anthropogenic ROG	%	NO _x	%	SO ₂	%
Refineries	1,066	22%	6,439	26%	4,232	17%	2,889	63%
Coke Calcining	28	1%	0	0%	239	1%	1,242	27%
Cement Plant	0	0%	0	0%	0	0%	0	0%
Other Major Industrial	569	12%	3,383	14%	2,139	8%	85	2%
Residential/Commercial	1,548	32%	5,649	23%	1,122	4.4%	49	1.1%
Agricultural	97	2%	369	1%	0	0%	0	0%
Miscellaneous	294	6%	20	0%	2	0%	0	0.0%
Mobile Sources	1,212	25%	9,041	36%	17,703	69.6%	296	6%
Total	4,814	100%	24,900	100%	25,437	100%	4,561	100%

1. Emissions from biogenic sources and accidental fires are not included in this inventory. Mobile emissions include shipping emissions within 3 nautical miles of the Bay Area coastline.
2. PM_{2.5} emissions for the Refineries category include condensable and filterable PM. Condensable PM data are not available for other source categories at this time.

Further, the five Bay Area refineries rank among the top ten facilities in the Bay Area for risk-weighted emissions of TACs, based on an evaluation of emissions from stationary sources in 2012 and using risk factors for cancer and chronic hazard indices.

Based on assessments of emissions of criteria pollutants and TACs from refineries, and to ensure the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standard (CAAQS)⁵ and ensure protection of the public from toxic air contaminants, the Air District has made emissions reductions from these facilities a high priority and intends to reduce refinery emissions by 20 percent by 2020, if feasible. To this end, staff has engaged in several rulemaking efforts to further reduce emissions of all air pollutants (including criteria and toxic pollutants) from the five Bay Area refineries, plus five associated facilities that either support refinery operation (two sulfuric acid plants and two hydrogen plants, and a coke calcining plant), which processes a refinery by-product. These emissions reduction efforts are part of an overall refinery strategy to address refineries and their impact on neighboring communities.

C. Air District Board Direction

On October 15, 2014, the Air District Board of Directors adopted Resolution Number 2014-07, instructing staff to develop a strategy based on an evaluation of approaches that would further reduce emissions from petroleum refineries, including:

- The “community-worker” approach outlined in a September 26, 2014 letter;
- Approach(es) proposed by industry;
- Approach(es) to require each refinery to develop a refinery emissions improvement plan. The plan would implement a suite of measures to demonstrate compliance with all applicable requirements to reduce emissions from petroleum refineries and to identify any additional feasible measures to utilize best practices to minimize emission and to assure continuous emission reductions; and
- Other approaches deemed appropriate by Air District staff.

The resolution also instructed Air District staff to prepare and present to the Board of Directors by December 2014, a strategy to achieve further emissions reductions from petroleum refineries that would include as a target a 20 percent reduction in refinery emissions, or as much as feasible. The resolution also provided that the strategy must include a schedule to implement regulations or other enforceable mechanisms as expeditiously as possible.

On December 17, 2014, the Board of Directors approved the staff-proposed approach that would blend the best of the evaluated approaches. This approach has the following components:

- Identify specific source categories with opportunities for cost-effective controls (this is also known as a Best Available Retrofit Control Technology review, or BARCT review);
- Adopt requirements identified in the EPA Refinery Risk and Technology Review;
- Include the quantitative goals from the Community-Worker proposal;
- Include continuous improvement as a goal for regulations;
- Retain compliance with the Health and Safety Code and the process transparency advocated by industry.

⁵ The Bay Area is designated as a non-attainment area for the State 8-hour and 1-hour standards and the National 8-hour standard for ozone; the State annual and 24-hour standards for PM₁₀; and the State annual standard and National 24-hour for fine particulate matter (PM_{2.5}). [<http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status>]

The Board of Directors also approved the following overall goals for the Petroleum Refinery Emissions Reduction Strategy:

1. Strive to achieve a 20 percent reduction in criteria pollutants and precursors within the next five years; and
2. Strive to achieve an additional 20 percent reduction in health risk from toxics.

D. Targeted Pollutants

The Petroleum Refinery Emission Reduction Strategy is intended to reduce emissions from the five Bay Area refineries and the five associated facilities of the following pollutants:

- Particulate matter (PM), including directly emitted filterable PM and condensable PM, as well as precursor compounds that form PM_{2.5} as a result of chemical reactions in the atmosphere. Condensable PM is particulate matter that forms after the hot emissions from the stack cool to ambient temperatures. These emissions are not quantified by traditional particulate testing methodologies because the sampling system does not operate at atmospheric temperatures and the condensable PM is a vapor at higher temperatures.
- ROG, a precursor in the formation of ground-level ozone.⁶
- NO_x, an ozone precursor and a contributor to fine PM formation.
- SO₂, a precursor to PM_{2.5} formation.
- Ammonia (NH₃), also a precursor to PM_{2.5} formation.

E. Phased Approach

Air District staff recommends a two-phase approach to complete the rulemaking for the Petroleum Refinery Emission Reduction Strategy:

1. Phase 1 is scheduled to be considered for adoption by the Air District Board of Directors at a public hearing on December 16, 2015; and
2. Phase 2 is scheduled to be completed in the third quarter 2016.

The first set of proposed regulations, Phase 1, is the culmination of over a year's effort developing information—such as emissions inventory, emissions reductions, control technology evaluation and cost estimates, cost effectiveness, and preliminary environmental impact review. Phase 1 includes the following three regulatory actions:

- New proposed rule, Rule 6-5: Fluidized Catalytic Cracking Unit (FCCU), to minimize condensable PM formation;
- Proposed amendments to Rule 8-18: Equipment Leaks, to address fugitive emissions of ROG and toxic compounds from refinery equipment; and
- Proposed amendments to Rule 11-10: Toxic and ROG emissions from Cooling Towers, to address ROG and toxic compounds from cooling towers.

⁶ Methane is not part of ROG because it has a low reactivity for ozone formation, although it is a potent greenhouse gas (GHG). The Air District expects some methane reductions as a co-benefit of ROG reductions. However, methane is not currently a targeted pollutant in this Petroleum Refinery Emission Reduction Strategy. It will be addressed through other measures in the Clean Air Plan.

The second set of regulatory actions, Phase 2, would focus on regulatory development for which staff has developed initial information, such as emissions inventory and cost estimates, but for which staff is currently in the process of gathering additional information needed for the regulatory development process, including environmental and socioeconomic information. Phase 2 would cover the following regulatory actions:

- New proposed rule, Rule 9-14: Petroleum Coke Calcining, to address emissions of SO₂ and the formation of PM_{2.5};
- Draft amendments to new Rule 6-5: FCCU to address emissions of SO₂ and condensable PM (if needed);
- Draft amendments to Regulation 9, Rule 1: Sulfur Dioxide, to further reduce emissions of SO₂ and the formation of PM_{2.5} from refinery fuel gas combustion and from sulfuric acid plants, and to address emissions of SO₂ from sulfur plants; and
- Draft amendments to Rule 9-9: Stationary Gas Turbines, to address emissions of NO_x.

F. Affected Facilities

There are five petroleum refineries in the Bay Area that may be affected by the emission reduction strategy:

1. Chevron Products Company (Richmond);
2. Phillips 66 Company – San Francisco Refinery (Rodeo);
3. Shell Martinez Refinery (Martinez);
4. Tesoro Refining and Marketing Company (Martinez); and
5. Valero Refining Company – California (Benicia).

There are also five associated support facilities that may be affected:

1. Chemtrade West (sulfuric acid plant that supports Chevron);
2. Eco Services (formerly called Solvay; sulfuric acid plant that supports Shell and Valero regularly, and Tesoro as needed when its acid plant is down for maintenance);
3. Air Products (hydrogen plant that supports Tesoro);⁷
4. Phillips 66 Carbon Plant; and
5. Air Liquide (hydrogen plant that supports Phillips 66).

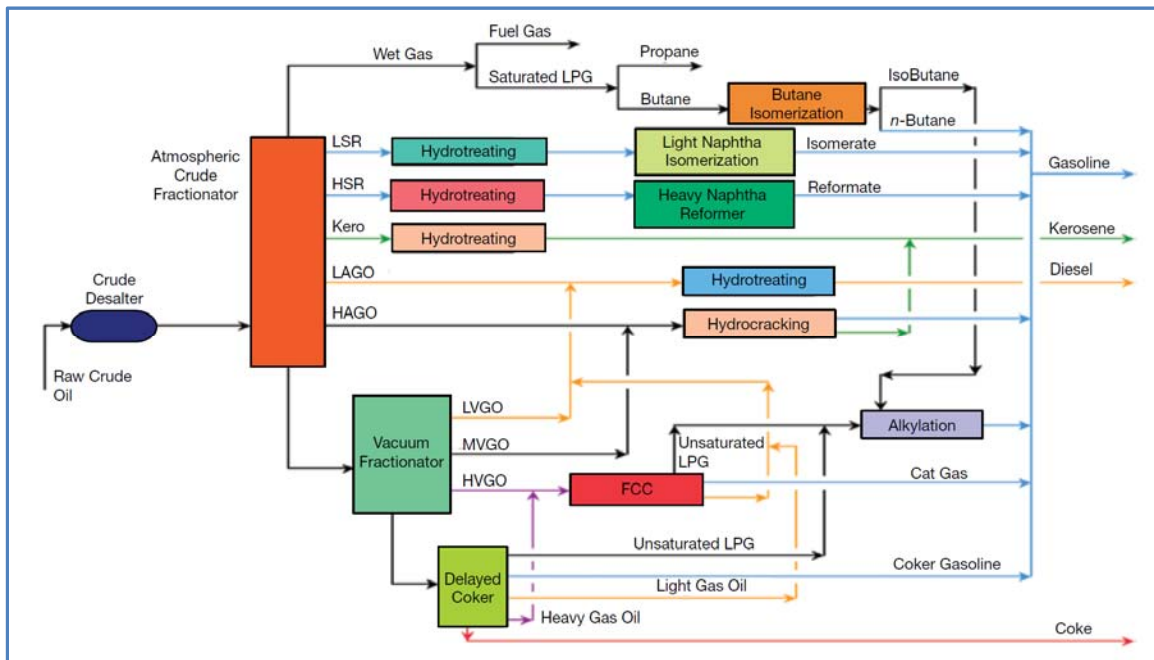
In addition, some other facilities will be impacted by the changes to Regulation 8, Rule 18: Equipment Leaks.

G. Petroleum Refining Processes

These facilities process crude oil into a variety of products such as gasoline, aviation fuel, diesel and other fuel oils, lubricating oils, and feedstocks for the petrochemical industry. The diagram in Figure 1 illustrates how various process units at petroleum refineries convert raw crude oil (petroleum) into fuels and other products.

⁷ There is also an Air Products plant that supports only the Shell Refinery. The emissions from that plant were included in the baseline inventory.

Figure 1: Refinery Flow Diagram



Legend: LSR = light straight-run naphtha; HSR = heavy straight-run naphtha; Kero = kerosene; LAGO = light atmospheric gas oil; HAGO = heavy atmospheric gas oil; LVGO = light vacuum gas oil; MVGO = medium vacuum gas oil; HVGO = heavy vacuum gas oil.

The processing of crude oil occurs in various process units or plants; some of the primary process units include:

- **Crude Desalter:** Crude oil is mixed with water to separate the salt and sediments from the crude.
- **Crude Unit:** The incoming desalted crude oil is heated and distilled into various fractions for further processing in other units.
- **Gas Concentration Unit:** Light hydrocarbons from the top of the crude unit are separated and distributed in the refinery fuel gas (RFG) system for use as fuel for heaters and boilers.
- **Vacuum Distillation Unit:** The residue oil from the bottom of the crude oil distillation unit is further distilled under heavy vacuum.
- **Hydrotreater:** Naphtha, kerosene, and gas oil are desulfurized from the crude unit by using hydrogen and converting the organically bound sulfur into hydrogen sulfide (a toxic compound).
- **Fluidized Catalytic Cracker Unit:** Longer chain, higher boiling hydrocarbons such as heavy oils are broken (or “cracked”) into lighter, shorter molecules at high temperatures and moderate pressure in the presence of a catalyst. This process is so named because the catalyst is so fine that it behaves like a fluid.
- **Butane Isomerization Unit:** Isobutene (a lighter hydrocarbon) is combined with olefins (heavier hydrocarbons) to form larger molecules known as alkylates, which are used in blending gasoline to boost the octane rating. Alkylates are considered one of the highest quality refinery products.
- **Light Naphtha Isomerization Unit:** Benzene is saturated and short, straight-chain hydrocarbons are isomerized into branched-chain hydrocarbons.
- **Heavy Naphtha Reformer and Hydrotreater:** Low-octane linear hydrocarbons (paraffins) are converted into aromatics using a catalyst. The process also forms hydrogen - used in the refinery’s hydrocracking and hydrotreating units - and benzene, toluene, and xylene (BTX) feedstocks, used in other process units.

- Hydrocracker Unit: Hydrogen is used to upgrade heavier fractions into lighter, more valuable products, such as diesel and jet fuel, in a high pressure system.
- Alkylation Unit: Butene and propene are reacted with isobutane into alkylate, a high octane gasoline component.
- Delayed Coker: Very heavy residual oils are converted into end-product petroleum coke as well as naphtha and diesel oil byproducts.
- Claus Sulfur Plant: A two-step (thermal and catalytic) process for recovering sulfur from gaseous hydrogen sulfide (H₂S) derived from refining crude oil. In the thermal step, H₂S laden gas is combusted to form elemental sulfur and sulfur dioxide (SO₂). In the catalytic step, a catalyst is used to boost the sulfur yield. In this step H₂S reacts with SO₂ to form elemental sulfur.

These primary process units, minor process units, auxiliary equipment (boilers, turbines, heat exchangers, etc.), and other refinery activities (such as truck and loader traffic) emit a variety of criteria pollutants, toxic air contaminants, and greenhouse gases. Other sources of emissions include waste water treatment, tanks, leaking equipment, pressure release devices, flares, marine terminals, and product loading, which are collectively subject to at least ten different Air District regulations.

III. PROPOSED RULES AND RULE AMENDMENTS

Air District staff is working on the following control measures that would comprise the Petroleum Refinery Emissions Reduction Strategy. The Phase 1 measures are covered in this staff report. Technical analysis has begun on the Phase 2 measures. Table 5 lists these individual control measures and rule development efforts.

Table 5: Description of Rule Changes

Title	Proposal Description
PHASE 1	
Rule 6-5: FCCU (Part 1)	Establish emission limits on fluid catalytic cracking units in oil refineries for ammonia, which expected to reduce emissions of condensable PM.
Rule 8-18: Equipment Leaks	Reduce fugitive emission of organic gases and toxic compounds through the following: <ul style="list-style-type: none"> • Include identification and monitoring of heavy liquid service equipment; • Amend the non-repairable equipment standard to reduce the allowable amount of equipment placed on non-repairable list; • Require quantification of leaks for all equipment placed on the non-repairable list; • Add a maximum leak concentration (10,000 ppm) that would apply to all equipment placed on the non-repairable list; and • Add a maximum mass emissions rate (five pounds per day) that would apply to any individual piece of equipment subject to monitoring by Rule 8-18. Administrative changes to rule language will be drafted to clarify and enhance enforceability of the rule.
Rule 11-10: Toxic and ROG Emissions from Cooling Towers	Reduce emissions of toxic organic gases and ROG from cooling towers by testing for and repairing heat exchanger leaks.
PHASE 2	
Rule 6-5: FCCU (Part 2)	Reduce SO ₂ and condensable PM emissions (if needed).
Rule 9-1: Sulfur Dioxide (Part 1)	Reduce SO ₂ emissions by the following: <ol style="list-style-type: none"> 1. Limit the sulfur content of refinery fuel gas to no more than 40 ppm; 2. Limit SO₂ emissions from sulfuric acid plants to no more than 0.20 lb. SO₂ per

Title	Proposal Description
	ton of acid produced; and 3. Reduce SO ₂ emissions from refinery sulfur plants to the extent that it is feasible.
Rule 9-14: Petroleum Coke Calcining	Reduce SO ₂ emissions and associated PM _{2.5} formation from the coke calcining facility through improvements to the emission control system.
9-9: Stationary Gas Turbines	Require the installation of selective catalytic reduction control on turbines with heat input greater than 100 MM BTU/hr. (The scope of this change may be expanded to include smaller turbines, if staff finds that there may be cost-effective opportunities for emission reductions on these smaller turbines.)
FURTHER STUDY MEASURES	
Rule 8-8: Industrial Wastewater	Review industrial wastewater collection, separation, and treatment system operations to develop an overall strategy to reduce air toxics and TOCs.
8-44: Marine Vessel Operations	Reduce organic gas emissions from marine loading operations that are within the Air District's authority in consideration of overlapping authority of the Coast Guard and other agencies.
9-10: Refinery Boilers, Steam Generators and Process Heaters	The majority of NO _x emissions at the refineries come from these sources. Recent updates to Rule 9-10 have tightened standards, but those reductions have not yet been reflected in the emissions inventory. Substantial work will be required to determine whether there are opportunities for additional controls.

Phase 1 items listed in the above table are the rules and amended rules that are being proposed for adoption at the December 16, 2015 Board of Directors meeting.

A. Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units

Staff proposes the major provisions in new proposed Rule 6-5 listed in Table 6.

Table 6: Major Provisions in Proposed Rule 6-5

Rule Section	Description
§ 6-5-301	Establish a new 10 ppmvd (at 3% oxygen concentration, daily average basis) ammonia emission limit from FCCUs effective January 1, 2018.
§ 6-5-401	Require submission of a control plan to comply with Section 6-5-301 and permit applications to perform required equipment modifications by January 1, 2017.
§ 6-5-402	Require submission of a monitoring plan to ensure compliance monitoring for Section 6-5-301 by January 1, 2017.
§ 6-5-403	As an alternative to compliance with Section 6-5-301, an FCCU operator may perform an optimization study leading to a new ammonia emission limit (presumably higher than the limit in Section 6-5-301) that is demonstrated to result in the greatest reduction in PM _{2.5} emissions from the FCCU that is achievable given other existing requirements on the FCCU.

B. Regulation 8, Rule 18, Equipment Leaks

Staff proposes the general changes to Rule 8-18 (Table 7), which would become effective January 1, 2018.

Table 7: Major Amendments in Proposed Rule 8-18

Rule Section	Description
§ 8-18-113	Require identification and monitoring of heavy liquid service equipment and subject heavy liquid service equipment to leak minimization and repair requirements.
§ 8-18-200	Additions to and clarification of definitions
§ 8-18-306	Reduce the allowable amount of equipment placed on non-repairable list.
§ 8-18-306.1	Add a maximum leak concentration (10,000 ppm) and require mass emission monitoring for all equipment placed on the non-repairable equipment list.
§§ 8-18-306.1 & 311	Establish a maximum mass emissions limit for fugitive equipment subject to the rule.
§ 8-18-401.11	Require the identification of the cause of any background reading greater than 50 ppmv.
8-18-502.6	Require submission of Piping and Instrumentation Diagrams (P&IDs) for equipment in heavy liquid service.

In addition, proposed administrative changes to rule language have been included to improve clarification and enforceability of the rule.

C. Regulation 11, Rule 10: Cooling Towers

Staff proposes the general provisions in new Rule 11-10 listed in Table 9.

Table 9: Major Provisions in Proposed Rule 11-10

Rule Section	Description
§ 11-10-200	Addition of new definitions for the new THC leak monitoring and leak repair provisions.
§ 11-10-304	THC leak monitoring requirements provide refineries three options.
§ 11-10-305	Progressive steps for leak action repair requirements.
§ 11-10-400	Leak reporting requirements and “Best Modern Practices” requirements.

In addition, proposed administrative changes to rule language have been included to improve clarification and enforceability of the rule.

IV. EMISSIONS AND EMISSION REDUCTIONS

The Air District has established a baseline emissions inventory for estimating emissions reductions from the new rules and proposed amendments to current rules in the Petroleum Refinery Emission Reduction Strategy. This inventory shows baseline emissions for pollutants targeted by the proposed regulations: PM (including directly-emitted filterable PM and condensable PM), TOG,⁸ NO_x, and SO₂. It includes emissions from petroleum refinery processes (e.g., feedstock and product handling, petroleum separation, and conversion and treating processes) as well as from auxiliary facilities such as hydrogen production, sulfur recovery, and power plants. Reporting year 2013⁹ was chosen as the baseline year because it is the most recent year for which the Air District has complete emissions data. However, equipment leak and cooling tower TOG emissions are based on reporting year 2014 because the calculation methodology for these source categories have been significantly improved in this reporting cycle.

⁸ The Air District’s emissions reporting system does not consistently differentiate between TOG and ROG emissions. Because TOG is the more inclusive category, it is being used for the development of the baseline.

⁹ The 2013 reporting year emissions correspond to emissions from calendar year 2012.

Table 10: Baseline Emissions from the Refineries and Associated Facilities

Facility Name	Average Annual Emissions (tons/year)				
	PM (filterable)	PM (cond.) ¹⁰	TOG	NO _x	SO ₂
Chevron	173	255	2,187	910	339
Phillips 66	53	—	337	266	409
Shell	409	98	1,749	971	1,084
Tesoro	80	91	1,200	763	572
Valero	123	—	494	1,205	111
Chemtrade West	4	—	55	3	127
Eco Services	18	—	1	13	362
Air Products	10	—	9	3	2
Phillips 66 (Carbon Plant)	29	—	0	239	1,242
Air Liquide	16	—	29	2	2
Total Emissions	915	444	6,061	4,375	4,250

The Air District has estimated the following emission reductions and costs for the regulatory actions under consideration (Table 11). More details may be found in the appendices to this document.

Table 11: Estimated Emissions Reductions and Costs for Rule Changes in Phase One

Title	PM (tons/year)	TOG (tons/year)	NO _x (tons/year)	SO ₂ (tons/year)	Costs (million \$/yr)
Rule 6-5: FCCU (Part 1) ¹¹	222	n/a	n/a	n/a	\$0.3
Rule 8-18: Equipment Leaks	n/a	1,227	n/a	n/a	\$6.8
Rule 11-10: Cooling Towers	n/a	861	n/a	n/a	\$2.2 ¹²
Totals for Phase 1	222	2,088	0	0	\$9.3

Table 11 shows that the Air District has identified significant opportunities for TOG reductions in this first phase of regulatory actions. As sources of filterable PM at the refineries are already cost-effectively controlled, the key opportunity for emissions reductions is from condensable PM. The Air District plans to address condensable PM by regulating emissions from FCCUs.

The total combined baseline emissions from the refineries are 16,045 tons per year. The emissions reductions from Phase 1 of the Petroleum Refinery Emission Reduction Strategy are estimated to be 2,310 tons per year, which means this initial phase is projected to reduce emissions from these sources

¹⁰ Condensable PM emissions are estimated based on a very small number of non-standard tests on FCCUs. These numbers will change as more testing is completed at the refineries.

¹¹ Air District staff is estimating a 50 percent reduction in condensable PM emissions from the FCCUs. But, since the baseline emissions are uncertain and the impact of the ammonia optimization is uncertain, the actual reductions are likely to be different. If insufficient condensable PM reductions are realized, more expensive add-on controls may be proposed in future rulemaking.

¹² Estimated costs range from \$1.1 million/yr to \$2.2 million/yr depending on the method selected by the refineries. The highest cost is shown here for consistency with the socioeconomic report.

by 14 percent.¹³ Air District staff is still developing emissions reductions estimates for Phase 2, but expects the combined emission reductions to meet or exceed the 20 percent goal set by the Board.

Twenty Percent Reduction in Risk from Toxic Emissions

Another of the goal of the Petroleum Refinery Emission Reduction Strategy is to reduce the risk from emissions of toxic compounds by at least 20 percent. Several of the rule development efforts undertaken in the strategy would reduce toxic emissions and risk. Specifically, amendments to Rule 8-18 would reduce VOCs, including toxic compounds, from leaking components, and amendments to Rule 11-10 would expand the scope of this airborne toxic control measure to included toxic organic gases from refinery cooling towers.

The key to addressing the impact of toxic pollutants from refineries is to determine which sources and pollutants are most responsible for increased health risk. To this end, staff will either develop a refinery-specific rule or general rule that would revise the requirements for the development and execution of Health Risk Assessments (HRAs) and the AB 2588 Air Toxics “Hot Spots” Act Action Levels for risk management that would significantly reduce the health impacts the from toxic emissions. Staff is considering proposing a reduction of the risk management action level from 100 in a million (100/M) cancer risk to 25 in a million (25/M). Further, the Office of Environmental Health Hazard Assessment (OEHHA) has updated the risk assessment guidelines and risk factors for TACs. The overall effect of the OEHHA Guideline revisions is an increase in cancer risk estimates. Although concentrations of pollutants may be the same for a given source, estimating cancer risk using the revised OEHHA guidelines will result in higher risk numbers. For most toxic air contaminants, the cancer risk will increase by about 40 percent for the same emission level compared to the cancer risk calculated using the previous HRA Guidelines. For a dozen TACs, the cancer risk could increase by up to a factor of five. These changes may result in many facilities, including refineries, triggering the public notification requirements under AB 2588. Once the impact of these changes are fully understood, Air District staff will determine the degree to which sources of toxic emissions would be impacted by the HRA guideline changes and a reduction in the risk management trigger level.

V. ECONOMIC IMPACTS

Pursuant to the California Health & Safety Code (H&SC), the Air District is required to perform two different types of economic analysis for rule development activities. The two required analyses are (1) a socioeconomic analysis under Health and Safety Code section 40728.5, and (2) an incremental cost analysis under H&SC section 40920.6. The California Health & Safety Code states, in part, that air districts shall endeavor to achieve and maintain state ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide by the earliest practicable date. In developing regulations to achieve these objectives, air districts shall consider the cost effectiveness of their air quality programs, rules, regulations, and enforcement practices in addition to other relevant factors, and shall strive to achieve the most efficient methods of air pollution control. However, priority shall be placed upon expeditious progress toward the goal of healthful air.

Since these economic analyses are specific to the particular rules, they are not addressed in the main body of this document. They may be found in the appendices specific to those rules.

¹³ Including, the reductions of condensable PM projected from rule 6-5, which are uncertain at this time.

VI. SOCIOECONOMIC IMPACTS

Section 40728.5 of the California Health and Safety Code requires an air district to assess the socioeconomic impacts of the adoption, amendment or repeal of a rule if the rule is one that “will significantly affect air quality or emissions limitations.” Applied Development Economics of Walnut Creek, California has prepared a socioeconomic analysis of proposed new Regulation 6, Rule 5 and amendments to Regulation 8, Rule 18 and Regulation 11, Rule 10. This analysis is based on the costs of compliance with the proposed regulations, and is attached to this report as Appendix E. The analysis concludes that the socio-economic impacts of compliance with the requirements of these rules are less than significant. Moreover, because affected sources are not small businesses, small businesses are not disproportionately impacted by the proposed rule changes.

VII. ENVIRONMENTAL IMPACTS

Pursuant to the California Environmental Quality Act, the District has had an initial study prepared by Environmental Audit, Inc. of Placentia, California for the proposed new Regulation 6, Rule 5, and amendments to Regulation 8, Rule 18 and Regulation 11, Rule 10. The initial study concludes that there are no potential significant adverse environmental impacts associated with these proposed amendments and proposed rule. A negative declaration is proposed for approval by the District Board of Directors. The negative declaration and initial study are provided in Appendix D.

VIII. REGULATORY IMPACTS

Section 40727.2 of the California Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and air district air pollution control requirements for the equipment or source type affected by the proposed change in air district rules. The air district must then note any differences between these existing requirements and the requirements imposed by the proposed change. The regulatory impacts analysis may be found in the appendices specific to those rules.

IX. RULE DEVELOPMENT AND PUBLIC CONSULTATION PROCESS

During this multi-phased rule development effort staff endeavored to engage all interested stakeholders, including affected industry, nearby community members, environmental organizations, other governmental agencies, the media, and other interested parties. There are several aspects to this public engagement, including:

- Development of conceptual versions of draft rules with discussions of those concepts;
- An advanced Call for Comments, released May 26, 2015, which included:
 - Petroleum Refinery Emissions Reduction Strategy: Initial Report
 - Concept Papers addressing each of the draft rules and rule amendments
 - Draft rule and rule amendment language
- Hosting a series of Refinery Rules Open House Workshops to solicit public input / comment on the Petroleum Refinery Emissions Reduction Strategy: Workshop Report, and revised concept papers for each of the draft new rules and draft rule and rule amendments. The Open Houses were held in the following locations:

- Martinez on September 15, 2015,
- Benicia on September 17, 2015, and
- Richmond on September 28, 2015;
- Meetings and consultations (community meetings, phone conversations, emails, letters) with interested stakeholders in less formal settings to discuss concerns and issues;
- Preparation of a regulatory package for the consideration of the Air District Board of Directors, including:
 - Proposed regulatory language;
 - A Staff Report presenting the staff’s findings, such as descriptions of the refining industry, regulatory history, summary and explanation of the proposal, emissions and emission reductions estimates, costs, cost effectiveness and incremental cost effectiveness, environmental and socioeconomic impacts, a schedule of implementation (when the provisions of the rule become effective if adopted), and staff recommendations to the Board of Directors;
 - An environmental analysis report;
 - A socioeconomic analysis report;
 - A discussion of and responses to comments received on the proposed rule, staff report, and environmental and socioeconomic analyses; and
- An informational Board meeting held on November 30, 2015 where presentations were made by Communities for a Better Environment and the Western States Petroleum Association and public testimony was provided by 43 individuals.
- Public Hearing, where the staff’s presentation is made and stakeholders may provide testimony to the Board of Directors on the staff proposal and at which the Board would consider the adoption of the proposal.

X. PRELIMINARY SCHEDULE OF THE PETROLEUM REFINERY EMISSION REDUCTION STRATEGY REGULATORY DEVELOPMENT

Table 12 provides a preliminary schedule for the development of each of the two phases of the regulatory effort. It should be noted that these are only rough estimates of the schedule and the dates may change as the effort proceeds.

**Table 12:
Schedule of the Petroleum Refinery Emission Reduction Strategy Regulatory Development**

Milestone	Phase 1	Phase 2
Concepts	April 2015	April 2015
Workshops	3 rd Quarter 2015	2 ND Quarter 2016
Public Hearing	4 th Quarter 2015	3 RD Quarter 2016

XI. COST RECOVERY

The Air District has the authority to assess fees to regulated entities for the purpose of recovering the reasonable costs of implementing and enforcing applicable regulatory requirements. On March 7, 2012, the Air District's Board of Directors adopted a Cost Recovery Policy that specifies that newly adopted regulatory measures should include fees that are designed to recover increased regulatory program activity costs associated with the measure (unless the Board of Directors determines that a portion of those costs should be covered by tax revenue).

In accordance with the adopted Cost Recovery Policy, Air District staff is developing a new fee schedule to be included in Regulation 3, Fees.

XII. CONCLUSION

Pursuant to Section 40727 of the California Health and Safety Code, the proposed new rules must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference. Proposed new Regulation 6, Rule 5 and amendments to Regulation 8, Rule 18 and Regulation 11, Rule 10 are:

- Necessary to ensure the attainment and maintenance of the NAAQS and California Ambient Air Quality Standard (CAAQS)¹⁴ and ensure protection of the public from toxic air contaminants given the size and impact of the refineries;
- Authorized under Sections 40000, 40001, 40702, 40725 through 40728, and 44391 of the California Health and Safety Code;
- Written or displayed so that their meaning can be easily understood by the persons directly affected by them;
- Consistent with other Air District rules, and not in conflict with state or federal law;
- Non-duplicative of other statutes, rules or regulations; and
- Implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 40000, 40702, and 44391.

The proposed new rules have met all legal noticing requirements, have been discussed with the regulated community, and reflect consideration of the input and comments of many affected and interested parties. Air District staff recommends adoption of proposed new Regulation 6, Rule 5 and proposed amendments to Regulation 8, Rule 18 and Regulation 11, Rule 10.

¹⁴ The Bay Area is designated as a non-attainment area for the State 8-hour and 1-hour standard and the National 8-hour standard for ozone; and the State standards for fine particulate matter (PM_{2.5}). [<http://www.baagmd.gov/research-and-data/air-quality-standards-and-attainment-status>]

APPENDICES

Appendix A: Rule 6-5: Fluidized Catalytic Cracking Units (FCCU)

Appendix B: Changes to Rule 8-18: Equipment Leaks

Appendix C: Changes to Rule 11-10: Toxic and ROG emissions from Cooling Towers

Appendix D: California Environmental Quality Act, Negative Declaration

Appendix E: Socio-Economic Analysis

Appendix A: Rule 6-5: Fluidized Catalytic Cracking Units (FCCU)

Rule/Rule Amendment Description

New Regulation 6, Rule 5, *Particulate Emissions from Refinery Fluidized Catalytic Cracking Units* (Rule 6-5) reduces emissions of particulate matter (PM) 2.5 microns or less (PM_{2.5} or fine PM) from fluidized catalytic cracking units (FCCUs) at petroleum refineries.

Goals

The goal of this rulemaking is to achieve emission reductions of PM_{2.5} and PM_{2.5} precursors from FCCUs at Bay Area refineries. The Air District plans to do this in two actions as described in the staff report.

1. The first action will be a new ammonia emission limit at FCCUs. Ammonia is primarily a concern because of its role as a precursor to the formation of condensable PM_{2.5} at the FCCU exhaust. Condensable PM_{2.5} occurs when ammonia in the FCCU exhaust reacts with compounds such as NO_x and SO_x, and the resulting compounds condense into PM_{2.5} once emitted from the FCCU exhaust. Thus, the proposed ammonia emission limit is an indirect limit on the emission of condensable PM_{2.5}.

Although the Bay Area currently has a “clean data finding” from EPA for the PM_{2.5} National Ambient Air Quality Standards (NAAQS), it has not been designated as being in attainment with PM_{2.5} requirements. More urgently, the Bay Area continues to be a nonattainment area for the state PM_{2.5} standard. Further, Air District staff has long held that ambient PM_{2.5} concentrations remain the driver for air pollution-based health impacts in the Bay Area. For these reasons, the Air District is obligated to take action to further reduce emissions of PM_{2.5} and its precursors in order to attain and maintain compliance with both state and federal PM_{2.5} standards.

The Air District is currently working with refineries that operate FCCUs to perform source testing of condensable PM_{2.5} emissions using the most recently developed and accurate testing methods. Although this testing will not be complete until 2016, testing at the Chevron FCCU using earlier versions of these methods suggests that FCCUs may be the largest source of condensable PM_{2.5} in the Bay Area.

2. The second action will be a later amendment to Rule 6-5 to directly address emissions of condensable PM_{2.5} (if additional cost effective emissions reductions can be realized) and in addition to address another fine PM precursor: SO_x. The specific measures to be proposed in the second action depend on the emission reductions achieved by the first action.

Background

FCCUs are complex processing units at refineries that convert heavy components of crude oil into light, high-octane products that are required in the production of gasoline. This conversion reaction is promoted with the use of a fine, powdered catalyst in the FCCU reactor vessel. During the reaction phase, the catalyst becomes coated with petroleum coke, which reduces the catalysts effectiveness. As a result, the petroleum coke must be burned off in the FCCU regenerator vessel so that the catalyst can be reused. This process and equipment are shown in Figure 1.

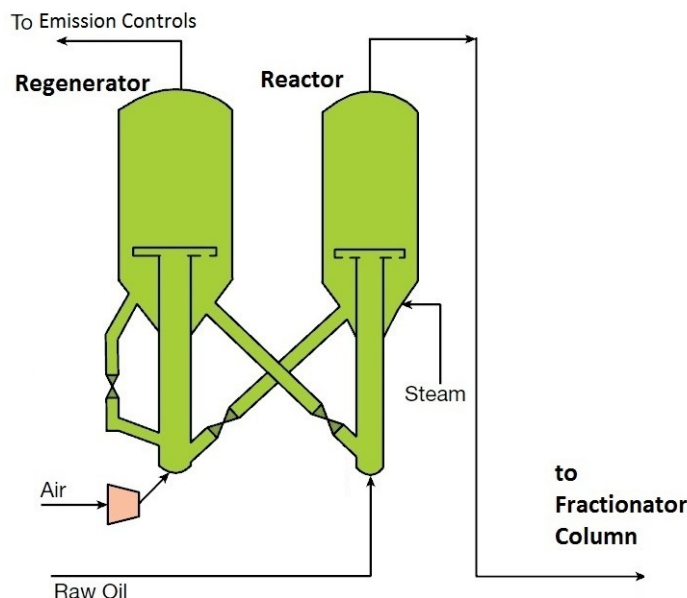


Figure 1 – FCCU Process

The emission stream from the FCCU results from the combustion gas created in the regeneration vessel exhaust. In addition to the pollutants that originate in the regeneration process—particulate matter (PM), sulfur dioxide (SO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), and volatile organic compounds (VOC)—other pollutants, such as ammonia and additional NO_x, are introduced or created downstream of the regeneration vessel. Most of the ammonia that is ultimately emitted from the FCCU exhaust is introduced downstream of the regenerator either to suppress NO_x formation or to increase the effectiveness of electrostatic precipitators (ESPs) in removing PM from the FCCU exhaust.

The Bay Area has five petroleum refineries. Four of these, Chevron, Shell, Tesoro and Valero, operate FCCUs. The Valero refinery has recently retrofitted its FCCU with a wet scrubber and therefore has lower PM_{2.5} and SO₂ emissions than the other refineries. The Chevron and Tesoro FCCUs use ammonia to control filterable particulate matter emissions in ESPs, resulting in unreacted ammonia being emitted to the atmosphere (*ammonia slip*). The Shell FCCU uses ammonia or urea injection to control NO_x emissions, as well as to improve ESP operation. Valero would be exempt from the proposed rule because the rule includes an exemption for FCCUs that are controlled by wet scrubbers that have been determined to be “best available control technology” (BACT).

Regulatory History and Context

There are currently no Air District regulations that apply to ammonia emissions from FCCUs. There are two federal standards in part 60 that may apply to FCCUs, depending on the year of construction, reconstruction, or modification, but neither one applies limits to ammonia emissions.¹

¹ 40 CFR part 60, subpart J, *Standards of Performance for Petroleum Refineries* and 40 CFR part 60, subpart Ja, *Standards of Performance for Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced after May 14, 2007*

Emissions

Based on recent source tests, ammonia concentrations at the FCCU catalyst regeneration outlet (post-control) are 29 parts per million by volume (ppmv) at the Chevron refinery and 23 ppmv at the Shell refinery. Source test data are not available for the Tesoro refinery, but emissions at Tesoro are estimated based on permitted use of ammonia. Based on these source test data and assumptions, District staff estimates the following condensable PM_{2.5} emissions from FCCUs:

Facility	2013 Condensable PM_{2.5} FCCU Emissions (tpy)
Chevron	255
Shell	98
Tesoro	91

Regulatory Concepts and Proposed Regulations

In 2003, South Coast AQMD adopted an ammonia emission limit of 10 ppmv, corrected to 3 percent oxygen, for FCCUs in their Rule 1105.1. Air District staff is proposing the same limit in Rule 6, Rule 5. Staff is also proposing the use of continuous emission monitoring (CEMs) to measure ammonia, whereas the South Coast AQMD requires annual source tests. An emission limit of 10 ppmv, also corrected to 3% oxygen, was recently imposed at the Bay Area Valero refinery FCCU in an Air District permit. The South Coast limit in Rule 1105.1 and Valero's FCCU limit appear to be the most stringent ammonia emission limits imposed on refinery FCCUs.

Although District staff is proposing a stringent ammonia emission limit, they recognize that ammonia and urea injection are used to promote total PM control at FCCUs by improving the efficiency of electrostatic precipitators (ESPs) and that these ESPs are subject to Air District and federal PM emission limits. Staff also recognizes that fine PM, rather than ammonia itself, is the FCCU emission of greater concern. Therefore, and as suggested by WSPA in response to an earlier draft of Rule 6-5, the proposed rule includes an exception to the 10 ppmv ammonia limit for a refinery that successfully performs an ammonia optimization to establish the level of ammonia and/or urea injection that will minimize overall PM_{2.5} emissions at the FCCU while still complying with other, existing FCCU emission limits. Any refinery utilizing this optimization limit would also be required to accept an enforceable ammonia emission limit at this optimized injection rate.

Control Mechanisms

Staff believes that the three refineries that operate FCCUs subject to the 10 ppmv ammonia emission limit will all elect to perform an ammonia optimization because this approach has the potential to achieve significant reductions in ammonia, and in associated emissions of condensable PM_{2.5}, with minimal capital expenses and minimal new operating costs.

Costs and Emissions Reductions

Although there will be one-time optimization costs and a new ammonia monitoring system, reduced use of ammonia and urea could result in overall long-term cost savings.

Emission reductions are based on current emission rates of 29 ppmv (Chevron) and 23 ppmv (Shell) being reduced to 10 ppmv, then applying the resulting percentage reduction to the associated mass emissions of ammonia at each refinery. Because of a lack of test data, the Tesoro emission reduction is assumed to be the same as at Shell. For the ammonia optimization option, reductions are assumed to be half of those

that would result from compliance with the 10 ppmv limit. For condensable PM_{2.5}, the goal of either a simple reduction in ammonia injection to achieve 10 ppmv ammonia slip, or an optimization of ammonia use is a 50% reduction in total condensable PM_{2.5} emissions.

Facility	Ammonia Reduction (tpy)		Condensable PM _{2.5} Reduction (tpy)	Capital Cost (\$ M)*	Annual Cost (\$ M)*	Total Annualized Cost (\$ M)*
	10 ppmv limit	Optimization				
Chevron	58	29	128	0.5*	0.025	0.093*
Shell	15	7.5	49	0.5*	0.025	0.093*
Tesoro	15**	7.5	46	0.5*	0.025	0.093*

*The optimization option in Rule 6-5 should not require capital investment or significant additional operating costs; capital, annual and annualized costs are for ammonia emissions monitoring with CEMs. Annualized costs are calculated using the capital recovery factor (CRF) method described in the "Policy and Implementation Procedure" of the Air District's "BACT-TBACT Workbook", assuming a 10-year equipment lifetime, 6% interest and default assumptions for a CRF of 0.136, which is applied to the capital costs to determine the annualized capital cost. Total annualized cost is the sum of the annualized capital cost and annual costs.

**Assumed to be the same as Shell refinery from reduced use of ammonia injection.

Regulatory Impacts

Section 40727.2 of the California Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and air district air pollution control requirements for the equipment or source type affected by the proposed change in air district rules. The air district must then note any differences between these existing requirements and the requirements imposed by the proposed change. The attached table shows that there are no other ammonia emission limits applicable to refinery FCCUs in the Air District, state or federal requirements. Although compliance with federal NSPS and NESHAP standards for particulate emissions and opacity might be affected by a reduction in ammonia and/or urea use at a particular FCCU, the rule provides an alternative standard to allow refineries to avoid interfering with compliance with these particulate emission and opacity limits.

Economic Impacts

The California Health and Safety Code generally requires two different economic analyses for proposed regulations by an air district. The first (H&S Code §40728.5) is a socioeconomic analysis of the adverse impacts of compliance with the proposed regulation on affected industries and business. The second analysis (H&S Code §40920.6) is an incremental cost effectiveness analysis when multiple compliance approaches that have been identified by an air district. These analyses are discussed below:

Socio-Economic Analysis (H&S Code §40728.5)

Section 40728.5 of the California Health and Safety Code requires an air district to assess the socioeconomic impacts of the adoption, amendment or repeal of a rule if the rule is one that "will significantly affect air quality or emissions limitations." Applied Development Economics of Walnut Creek, California has prepared a socioeconomic analysis of draft Rule 6-5. This analysis is based on the costs of compliance with the draft regulation discussed above, and is attached to the staff report. The analysis concludes that the socio-economic impact of compliance with the requirements of Rule 6-5 is less than significant.

Incremental Cost Evaluation (H&S Code §40920.6)

Section 40920.6 of the California Health and Safety Code requires an air district to perform an incremental cost analysis for any proposed Best Available Retrofit Control Technology rule or “feasible measures” rule when the air district has identified more than one potential control option to achieve the emission reduction objectives of the rule. In the proposed rule, Air District staff has identified only one potential control option to achieve an ammonia emission rate of no more than 10 ppmv: a reduction in ammonia or urea use. The ammonia optimization option in Section 6-5-403 is expected to achieve a lesser level of ammonia emission reduction than simple compliance with the 10 ppmv limit. Therefore, no incremental cost analysis is necessary and none has been performed.

Because Air District staff believes that the three affected refineries will elect to perform an ammonia optimization, cost-effectiveness for the rule is conservatively based on the expected condensable PM_{2.5} emission reductions for optimization (50% of the reductions shown above which correspond to compliance with the 10 ppmv ammonia emission limit) divided by the total annualized cost of compliance (for ammonia emissions monitoring):

Facility	Total Annualized Cost (\$)	Condensable PM_{2.5} Annual Reduction (ton)	Cost-Effectiveness (\$/ton of PM reduction)
Chevron	93,000	64	1,500
Shell	93,000	24	3,900
Tesoro	93,000	23	4,000

Minor Changes from the Proposed Rule

The Air District posted a proposed version of Regulation 6, Rule 5 on October 23, 2015. The final version of the rule includes a few minor changes intended to either make the rule more readable or to clarify the intent of the rule.

1. Editorial: Renaming two definitions and renumbering to maintain alphabetical order in Table of Contents.
2. Editorial: Corrected title of Section 112 in Table of Contents.
3. Clarification: In response to e-mailed comment from Shell refinery, Staff made explicit the provision that non-FCCU sources with emissions that are subject to Section 301 AND that have startup or shutdown provisions in a District permit are eligible for the limited exemption in Section 112 under the terms of their own permit conditions, rather than under the terms of the FCCU startup and shutdown provisions that are defined in this rule. Therefore, the limited exemption in Section 301 applies to all sources subject to this section whenever ANY source is in a startup or shutdown condition. This treatment is necessary because non-FCCU sources subject to Section 301 have a commingled emission stream with an FCCU and there is no way to differentiate emissions by source. This clarification is in Section 112.

Regulation 6, Rule 5, Section 40727.2 Analysis

Section	Description (paraphrased)	Comparable State/District Rules	Comparable Federal Rules	Discussion
101	Description	NA	NA	No applicable requirements
111 - 115	Exemptions and Limited Exemptions	NA	NA	No applicable requirements
201 - 211	Definitions	NA	NA	No applicable requirements
301	Ammonia slip emission concentration limit	None	40 CFR 60 Subpart J (NSPS)	Subpart J does not include ammonia emission limits from FCCUs. Subpart J does include particulate emission limits and opacity limits, and compliance with these limits is potentially affected by a reduction in ammonia use. If this is an issue for a particular refinery, Section 403 provides an alternative standard to minimize condensable PM _{2.5} emissions while remaining in compliance with other applicable limits, such as those in Subpart J.
	Ammonia slip emission concentration limit	None	40 CFR 60 Subpart Ja (NSPS)	Subpart Ja does not include ammonia emission limits from FCCUs. Subpart J does include particulate emission limits, and compliance with these limits is potentially affected by a reduction in ammonia use. If this is an issue for a particular refinery, Section 403 provides an alternative standard to minimize condensable PM _{2.5} emissions while remaining in compliance with other applicable limits, such as those in Subpart Ja.
	Ammonia slip emission concentration limit	None	40 CFR 63 Subpart UUU (NESHAP)	Subpart UUU does not include ammonia emission limits from FCCUs. Subpart UUU requires compliance with the particulate emission limits in NSPS Subpart J – see discussion for NSPS Subpart J.
401	Ammonia Control Plan and Permit Applications	NA	NA	Administrative requirement
402	Ammonia Monitoring Plan	NA	NA	Administrative requirement
403	Ammonia Optimization (alternative to 301)	None	None	This is an alternative to Section 301.

Section	Description (paraphrased)	Comparable State/District Rules	Comparable Federal Rules	Discussion
501	Ammonia Monitoring	None	40 CFR 60 Subpart J (NSPS)	Subpart J does not include ammonia monitoring for FCCUs.
	Ammonia Monitoring	None	40 CFR 60 Subpart Ja (NSPS)	Subpart Ja does not include ammonia monitoring for FCCUs.
	Ammonia Monitoring	None	40 CFR 63 Subpart UUU (NESHAP)	Subpart UUU does not include ammonia monitoring for FCCUs.
502	Ammonia Records	NA	NA	Administrative requirement
601	Compliance Determination	NA	NA	Administrative requirement
602	Determination of Ammonia and Oxygen	NA	NA	Administrative requirement

Appendix B: Changes to Rule 8-18: Equipment Leaks

Rule/Rule Amendment Description

Regulation of equipment leaks at oil refineries requires amendments to Regulation 8, Rule 18, *Equipment Leaks* (Rule 8-18).

Goals

The goal of this rulemaking is to achieve further reductions in fugitive emissions of volatile organic compounds (including toxic organics) at refineries.

Background

Facilities that store, transport, and use volatile organic liquids lose some organic material as fugitive emissions wherever there is a leaking connection between two pieces of equipment. Valves, pumps, and compressors at these facilities can also leak organic material past internal seals.

To address emissions from the large facilities responsible for most of these emissions, Rule 8-18 requires oil refineries, chemical plants, bulk plants, and bulk terminals to maintain a leak detection and repair (LDAR) program. These programs are carried out by periodically checking components for leaks using leak detection equipment that measures leak concentrations, which are generally expressed in parts per million volume (ppmv).

Equipment subject to the monitoring requirements (initial boiling point of 302 degrees Fahrenheit or less) is inspected at specified intervals and, if a leak is found to exceed the leak concentration limit in the rule, the equipment must be repaired, replaced, or placed on limited list of non-repairable equipment. Currently, equipment in heavy liquid service (initial boiling point of greater than 302 degrees Fahrenheit) is subject to the applicable leak standards in Section 8-18-300. However, these components are not subject to the requirements in Section 8-18-400 for inspections using leak detection equipment. They are, however, subject to federal inspection requirements that do not rely on instrument measurements. But without routine inspections of equipment in heavy liquid service using leak detection equipment, leaks may not be found and repaired.

LDAR programs have been found to reduce (“control”) emissions from equipment leaks by over 98 percent (e.g. leaks from components in gas or light liquid service would be 50 times greater than current estimates). A similar reduction is expected for monitoring equipment in heavy liquid service. Emissions from equipment leaks come from a small portion (one to five percent) of all components with 95 to 99 percent of all components not leaking, regardless of service type (gas, light liquid or heavy liquid). Therefore, hundreds of components have to be monitored to find one that is leaking.

Process and Source Description

Component leaks commonly occur at the joints or connections between sections of piping, at valves, at pumps or from barrier fluid contained between seals, and at the seat of pressure relief devices (PRDs).

Regulatory History and Context

The Air District originally adopted Rule 8-18 in 1980 and has amended it twice, first in 1992 and again in 2004. In addition, some minor changes were made to the rule in 1998 and 2002. The original intent of the rule was to control fugitive organic gas leaks from valves and connectors at refineries, chemical

plants, bulk plants, and bulk terminals. Rule amendments adopted in 1992 significantly lowered the allowable leak concentration limits to the lowest levels in the country and required more effective inspection and repair programs in order to reduce emissions and promote self-compliance. The 1992 amendments reduced emissions by an estimated 1.2 tons per day (tpd).

The allowable leak standard is 500 ppmv for pumps, compressors, and PRDs.¹ For valves and other equipment, the allowable leak standard is 100 ppmv. Leaks are detected and the leak concentration is measured using a portable combustible gas indicator.

The U.S. Environmental Protection Agency (EPA) has promulgated LDAR standards for facilities in the synthetic organic chemical manufacturing industry and petroleum refineries. The EPA's standards in 40 CFR parts 60 and 63 include LDAR provisions for monitoring and repairing equipment in heavy liquid service that do not rely on instrumental monitoring, but instead rely on "visual, audible, olfactory, or any other detection method."

Emissions

The Air District maintains an inventory that includes emissions from all stationary sources within its jurisdiction. For complex facilities like refineries, emissions from each type of source are calculated. For fugitive emissions subject to Rule 8-18, emissions are calculated using component counts and emission factors that represent average emissions for a particular component type in a particular type of service (e.g., valves in light liquid service). Emissions must be calculated because leak measurements give the concentration of leaking gases but not the mass emissions (which would require knowledge of the flow rate in addition to the concentration).

There are five large refineries operating within the jurisdiction of the Bay Area Air Quality Management District (Air District). Table B-1 summarizes the total equipment inventory currently regulated under Air District Rule 8-18 at the five major refineries in the Bay Area for the calendar year 2013.

Table B-1: Fugitive Equipment Component Counts¹

Valves	Pumps & Compressors	Pressure Relief Devices²	Connectors³	Total TOG (TPY)⁴
273,239	2,705	1,142	1,016,636	1,791

¹Counts do not include components in heavy liquid service.

²The count includes atmospheric PRDs only.

³Connector counts are not required to be identified per Section 8-18-402.1 or monitored per Section 8-18-401 unless refineries desire the repair period allowance of Section 8-18-304.2. Only two Bay Area refineries record all connector measurements, while three refineries record only connectors with leaks that exceed the standard. An average multiplier (3.5 x total valve inventory) was used to determine the total connector count for facilities that did not record all connector counts.

⁴Total organic emissions from the 2013 BAAQMD Emissions Inventory.

The emission factors used by the Air District for calculating refinery fugitive emissions come from a series of refinery studies by EPA in the late 1970's and early 1980's. EPA developed average emission factors for various types of equipment in various types of service. EPA later combined the refinery fugitive emission factors with factors for petroleum terminals and for gas and oil production in a 1995 guidance document ("EPA Protocol")². The California Air Resources Board (ARB) and the California Air

¹ PRDs are also subject to the requirements of Air District Regulation 8, Rule 28, *Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants*.

² Environmental Protection Agency, "1995 Protocol for Equipment Leak Emission Estimates" (EPA453/R-95-017

Pollution Control Officers' Association (CAPCOA) relied upon the EPA document in developing fugitive emission guidelines for refineries ("ARB Guidelines")³. The ARB Guidelines generally incorporate refinery fugitive emission factors from the EPA Protocol.

Regulatory Concepts and Proposed Regulations

The Air District is proposing the following changes to Regulation 8, Rule 18 that would:

- Require identification of all equipment in heavy liquid service; monitoring of heavy liquid service valves, pumps and PRDs; and leak minimization and repair for these components, effective January 1, 2018;
- Amend the non-repairable equipment standard to reduce the allowable amount of equipment placed on non-repairable list;
- Identify the cause of any background reading greater than 50 ppmv;
- Require mass emission monitoring for all equipment placed on the non-repairable equipment list; and
- Add a maximum leak concentration and/or mass emissions limit for fugitive equipment subject to the rule.

In addition, administrative changes to rule language will be made to improve clarification and enforceability of the rule. The proposed changes are discussed in more detail below.

Additional Requirements to Monitor Equipment in Heavy Liquid Service

Equipment in heavy liquid service is not currently subject to routine inspection and repair under Rule 8-18. Effective January 1, 2018, the proposed amendments would require all facilities subject to the rule to include in their LDAR program identification and routine monitoring of heavy liquid equipment. Table B-2 summarizes equipment in heavy liquid service at the five major refineries that would become subject to new inspection and repair requirements.

Table B-2: Heavy Liquid Service Equipment Fugitive Component Counts

Facility	Valves	Pumps	Pressure Relief Devices¹	Connectors²
Chevron	32,228	1,859	62	127,977
Phillips 66	6,655	293	6	27,350
Shell	12,734	337	20	37,361
Tesoro	10,976	250	70	38,416
Valero	15,570	193	0	56,596
Total	78,163	2,932	158	287,700

¹The count includes atmospheric PRDs only.

²An average multiplier (3.5 x total valve inventory) was used to determine the total connector count for facilities that did not provide an accurate connector count.

Based on the Air District's 2013 emissions inventory, fugitive emissions from the heavy liquid equipment listed above are estimated at 1,476 tons per year (excluding methane). The Air District used EPA's

³ California Air Resources Board, "California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities". February 1999. Appendix A. Documentation of Guidelines Development. Appendix A-1, p. 2.

emission factors⁴ to estimate baseline emissions for equipment in heavy liquid service. Both the Air District and the refineries have used the emission factors for decades to estimate and report emissions from heavy liquid service components in permit applications⁵ and in annual inventory data submitted by the refineries.

The Western States Petroleum Association (WSPA) and the Bay Area petroleum refineries contend, however, that the average emission factors used to calculate emissions before controls do not represent actual emissions and that actual emission factors at the five refineries are lower. They collected data on components in heavy liquid service that suggests lower emissions. However, this effort represented less than 0.2 percent of heavy liquid service components, which was not a large enough sample size to identify potential leaks, did not include mass emissions sampling, and was not collected in such a way that the Air District could verify that it accurately represented the emissions from components in heavy liquid service. Because the data is inadequate, Air District staff have relied upon the EPA emission factors and the ARB Guidelines to estimate emissions. However, the Air District and WSPA are currently working on a mass emissions sampling study in an attempt to obtain the most accurate data. This study is expected to be finished before the end of 2016, well before proposed changes in heavy liquid monitoring are scheduled to take effect.

If the study shows actual emissions from components in heavy liquid service to be significantly lower than the EPA emission factors would suggest, the requirements for monitoring these components may not be cost effective. If District staff determine the requirements are not cost effective, staff will propose amendments to the rule.

Reducing the Amount of Equipment on Non-Repairable List

The Air District established the non-repairable list to allow sources to delay repairs of essential equipment for five years or until the next scheduled turnaround, whichever comes first.⁶ Essential equipment is defined as any equipment that cannot be removed from service unless the process unit is shut down and the component is isolated. This activity would likely create more emissions than the actual fugitive leaks.

The five refineries in the Bay Area currently have an average of 24 pieces of equipment, mostly valves and connectors, on their non-repairable equipment lists.⁷ The average percentage of valves and connectors on a non-repairable list is 0.04 percent (allowable percentage of valves including connectors is 0.30 percent), which indicates the LDAR programs implemented at the five refineries can achieve a much lower fraction of equipment placed on a non-repairable list than the fraction currently allowable by the rule. The inclusion of heavy liquid service components will increase the overall number of pieces of equipment allowed on the non-repairable list. It is expected that this increase will more than offset the reduction in percentage of overall allowable equipment on the non-repair list given the historical trends (0.04 on current lists versus current allowable of 0.30%).

⁴ As listed in the ARB Guidelines, Table IV-1a.

⁵ E.g., 1981 Chevron Richmond Lube Oil Project (RLOP) application, 1992 Shell Clean Fuels Project application.

⁶ BAAQMD Regulation 8, Rule 18, Section 306.1.

⁷ Average non-repairable equipment count calculated with each connector counted as two valves pursuant to Section 8-18-306.3.

Further efforts in eliminating equipment from the non-repairable list may enable LDAR programs to approach the point where non-repairable equipment lists would no longer be necessary and the issue of non-repairable equipment could be addressed by other means.

Mass Emissions Determination for Equipment on Non-Repairable List

Because all equipment placed on the non-repairable list is allowed to leak above the applicable leak standard for up to five years, the mass emission rate of any equipment placed on the non-repairable equipment list should be determined and should not exceed a mass emissions limit. A mass emissions limit on non-repairable equipment provides an incentive to replace or repair the high emitting equipment as soon as possible, which is better than allowing equipment to remain on the non-repairable list up to five years, regardless of its emission rate.

Addition of a Fugitive Mass Emission Limit

Leak standards are expressed as concentration-based limits rather than mass-based limits to better allow field staff to quickly determine compliance. Mass emissions are determined by quantifying both the concentration and the flow rate of a leak. It is possible that low concentration leaks may have a high flow rate resulting in significant emissions. Currently, monitoring of mass emissions is only required for those valves that leak organic compounds greater than 10,000 ppm (a “major leak”) for more than 45 days. No Bay Area refinery has triggered this requirement to date, and therefore, no mass emissions monitoring has been done.

Clarification of the Leak Repair Definition

The current rule requires any leak discovered by the operator and not repaired within 24 hours to be minimized within the first 24 hours following leak discovery. The minimization must be done using best modern practices to reduce the leak to the lowest achievable level, regardless of whether the leak is ultimately repaired within the allowed seven days or placed on the non-repairable equipment list.

Many facility owner/operators incorrectly believe cleaning leaking equipment with soap and/or water complies with the best modern practice requirement. As stated in the Air District’s September 2013 Compliance Advisory, leak minimization should include some type of repair attempt, which may include tightening bolts, replacing bolts, tightening packing gland nuts, and injecting lubricant into packing. The rule amendments to clarify what is required for leak minimization by amending the definition language to identify specific types of minimization methods. Also, the definition will state that cleaning, scrubbing, or washing equipment alone is not considered best modern practice.

Identification of High Background Readings

Leak limits are expressed as “above background” where *background* is defined as, “The ambient concentration of total organic compounds determined at least three meters (10 feet) upwind from the equipment to be inspected and not influenced by any specific emission point as indicated by a hydrocarbon analyzer specified by Section 8-18-501.” A review of 2013 monitoring data from the five refineries identified numerous instances of high background concentrations, including a case with a background of 500 ppmv (five times the existing leak standard for equipment other than a pump or pressure relief device and equal to the limit for pumps and pressure relief devices). To address high background concentrations, the Air District is considering a new requirement that would require identification of the cause of any background reading greater than 50 ppmv (half the existing leak standard). Identification of a cause for elevated background concentrations may identify other equipment in need of repair or replacement.

Control Mechanisms

The Air District proposes no new control mechanisms, only expansion and improvement of the existing LDAR program.

Costs and Emissions Reductions

Table B-3 shows VOC emission reductions and costs associated with improvements to the LDAR program.

Table B-3: Emissions Reductions and Costs

Facility	Emission Reduction (tpy)	Capital Cost (\$ M)	Total Annualized Cost (\$ M)
Chevron	641	\$0.11	\$2.6
Phillips 66	117	\$0.02	\$0.70
Shell	156	\$0.04	\$0.90
Tesoro	143	\$0.03	\$1.4
Valero	170	\$0.05	\$1.2
Total	1,227	\$0.25	\$6.8

The Air District has only calculated emission reductions that would come from the proposed inspection requirements for components in heavy liquid service. The Air District has estimated the effect of these controls by relying upon a correlation equation method included in the EPA Protocol and the ARB Guidelines. The correlation equation method generally relies on measured leak concentration data. Instead of using actual measurements, the Air District conservatively assumed that with the new inspection requirements for heavy liquid components, all would leak at the highest concentration allowed by Regulation 8-18 leak limits.

Incremental Cost

Under Health and Safety Code section 40920.6, the Air District is required to perform an incremental analysis when adopting a Best Available Retrofit Control Technology (BARCT) rule or feasible measure required by the California Clean Air Act. To perform this analysis, the District must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness of each option.

Option 1

The Air District considered the option of monitoring piping connectors quarterly, rather than annually. Monitoring costs increase by \$12.00 per connector, or \$3.45 M annually. Expected emission reductions from this increased monitoring frequency is estimated to be approximately 40 tons per year, so the incremental cost effectiveness of this option is more than \$86,000 per ton.

Option 2

The Air District considered the option of continuing to allow each refinery to monitor heavy liquid equipment using the “visual, audible, olfactory, or any other detection method” approach. This option was not considered adequate because the emission factor studies done to quantify emissions from heavy liquid equipment were conducted in facilities where equipment with significant leaks were found undetected using the visual, audible, olfactory methods.

Other Impacts

Regulatory Impacts

California Health and Safety Code section 40727.2 requires the Air District to identify existing federal air pollution control requirements for the equipment or source type affected by the proposed rule or regulation. The District must then note any differences between these existing requirements and the requirements imposed by the proposal.

Regulation 8, Rule 18: Equipment Leaks applies to fugitive emissions from valves, pumps, compressors, pressure relief devices, connection and any other component that may have fugitive leaks. The proposal expands the applicability or the current rule to equipment in heavy liquid service.

Numerous federal requirements apply to fugitive emissions at the facilities subject to Regulation 8, Rule 18. New sources are subject to New Source Performance Standards found in 40 CFR Part 60, Subpart VV/VVa (Equipment Leaks of VOC in the Synthetic Organic Chemicals Industry) and Subpart GGG/GGGa (Equipment Leaks of VOC in Petroleum Refineries). Other sources are subject to National Emission Standards for Hazardous Air Pollutants (NESHAPS) found in 40 CFR Part 61, Subpart V (National Emission Standards for Equipment Leaks (Fugitive Emission Sources)), and to 40 CFR Part 63, Subpart CC (National Emission Standards for Petroleum Refineries). Table B-4 below is a simplified comparison between BAAQMD and federal requirements.

Table B-4 - Comparison of the Basic Provisions of the Fugitive Emissions Rules of Federal and BAAQMD

BAAQMD Regulation 8 Rule 18	40 CFR 60 VV/VVa & GGG/GGGa 40 CFR 63 CC
Applicability	
Components at petroleum refineries, chemical plants, bulk plants and bulk terminals.	Affected equipment in petroleum refineries, synthetic organic chemicals manufacturing facilities, and onshore natural gas processing plants.
Requirements	
LDAR program including quarterly inspection of equipment in light liquid/gas/vapor. Connectors in light liquid/gas/vapor service and inaccessible equipment inspected annually.	Pumps and valves inspected monthly. Valves in light liquid/gas/vapor service inspected monthly. After two monthly inspections without leaks, equipment may be inspected quarterly until a leak is detected.
Leak threshold at 100 ppm for any general equipment, valves and connectors. Leak threshold	Leak threshold at 10,000 ppm for pumps and valves in heavy liquid service.

BAAQMD Regulation 8 Rule 18	40 CFR 60 VV/VVa & GGG/GGGa 40 CFR 63 CC
of 500 ppm for any pumps, compressors and PRDs.	
Leaks detected by operator minimized within 24 hours and repaired within 7 days Leaks detected by BAAQMD repaired within 24 hours A percent of non-repairable equipment may delay repair until unit turnaround.	Pump, valves, PRDs and connectors in light liquid service/gas/vapor service leak threshold at 10,000 ppm. Compressors required to have a seal system with barrier fluid. PRDs in gas/vapor service leak threshold at 500 ppm
	Leaks > 10,000 ppm 15 days repair maximum, first attempt at repair with 5 days.
Recordkeeping and Reporting	
Submit quarterly reports of non-repairable equipment and their leak rates. Submit equipment inventory report annually	Submit semiannual reports containing the number of equipment by type that were repaired and for which repair was delayed and the reason for delay
Test Methods	
U.S. EPA Method 21 for leak screening, ASTM Method D-86 for VOC content of liquids and EPA Protocol for Equipment Leak Emissions Estimates, Chapter 4 or monitoring for mass emission sampling.	U.S. EPA Method 21 for leak screening, ASTM E-260, E-168, E-169 for the VOC content, ASTM Method D-2879 for vapor pressure.
Exemptions	
Pressure vacuum valves on storage tanks not exempt from District Regulation 8 Rule 5	Components operating under negative pressure, pumps with closed vent system, PRDs vented to a control device.
Controlled seal systems and PRDs vented to a vapor recovery system or disposal system which reduces emissions of organic compounds by 95% or greater.	
Equipment in vacuum service	

This proposal is not duplicative of any current requirements for equipment in heavy liquid service.

Minor Changes from the Proposed Rule

The Air District posted a proposed version of Regulation 8, Rule 18 on October 23, 2015. The final version of the rule includes a few minor changes intended to either make the rule more readable or to clarify the intent of the rule.

1. Clarification: In response to a comment made by the Western States Petroleum Association (WSPA), the Air District has added a limited exemption 8-18-119 to the rule which addresses open-ended valves or lines in an emergency shutdown system designed to open automatically in the event of a process upset, and open-ended valves or lines containing materials which would

autocatalytically polymerize or would present an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block and bleed system

2. Clarification: In response to a comment made by WSPA, the Air District has added limited exemption 8-18-120 which includes an effective date in which the new standards will not apply to the equipment currently on the non-repairable list.
3. Editorial: In response to a comment made by WSPA, the Air District has correct a formatting issue and removed the new proposed language and keep the definition as written in the current version of the rule.
4. Editorial: In response to a comment made by WSPA, the Air District has made a correction to the formatting in section 401. Subsection 8-18-401.3 now references section 403 and not 403.2.
5. Editorial: In response to a comment made by WSPA and Valero, the Air District is not deleting Section 8-18-308, Alternate Compliance. The Air District will assign a new section number (407) to the Recurrent Leak Standard and the existing 405 Section (Alternative Emission Reduction Plan) and 406 Section (Interim Compliance) will remain in the rule to comply with H&S Code Section 40001(d).
6. Editorial: In response to a comment made by WSPA, the Air District corrected the repeat section 404.2 and 404.3 formatting error to 407.2 and 407.3 so it follows sequentially after the preceding Section (407.1).

Appendix C: Changes to Rule 11-10: Cooling Towers

Rule/Rule Amendment Description

Regulation of organic gases and toxic air contaminants from cooling towers at refineries requires amendment to Air District Regulation 11, Rule 10, *Hexavalent Chromium Emissions from Cooling Towers* which will be renamed *Hexavalent Chromium from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers*.

Goals

The goal of this rulemaking is to achieve technically feasible and cost-effective total hydrocarbon (THC) and Toxic Air Contaminant (TAC) emission reductions from cooling towers at Bay Area refineries by requiring more rapid detection of heat exchanger leaks.

BACKGROUND

The Bay Area has five petroleum refineries which operate a total of 32 cooling towers that would be impacted by this amendment. These cooling towers are large, industrial heat exchangers that are used to dissipate significant heat loads to the atmosphere through the evaporation of water. When heat exchanger leaks go undetected for long periods of time, significant quantities of organic compounds can be stripped from the cooling tower water and emitted to the atmosphere. Many of these cooling towers are subject to EPA testing and repair requirements, but the Air District staff believes that more frequent and rigorous testing and repair requirements are needed to ensure protection of public health. These more rigorous requirements will not pose undue cost burdens on the refineries.

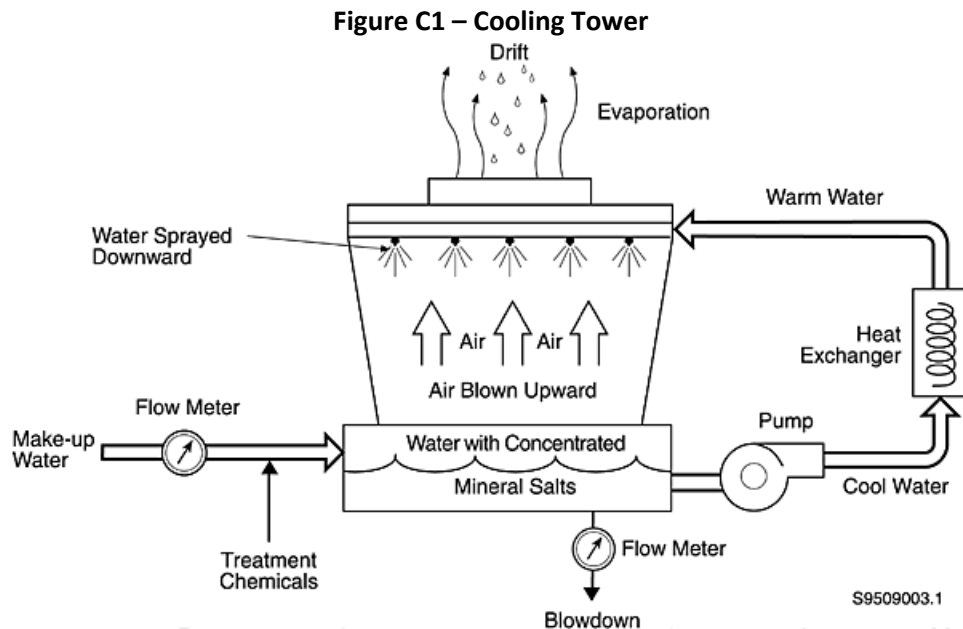
The following table (Table C1) provides the distribution of cooling towers throughout the five refineries.

**Table C1
Number of Affected Cooling Towers at Each Refinery**

Facility	Number of Cooling Towers
Chevron	8
Shell	3
Tesoro	13
Phillips 66	7
Valero	1
TOTAL	32

Process and Source Description

Cooling towers are part of a heat exchange system consisting of a device or a collection of devices used to transfer heat from process fluids to water without intentional direct contact of the process fluid with the water and to transport and/or cool the water in a closed-loop system (cooling tower system). Figure C1 (below) depicts a basic cooling tower structure.



Cooling towers can be designed as either natural draft or mechanical draft devices. Natural draft cooling towers are large hyperbolic structures that look similar to those found at nuclear power plants. They use natural convection of warmed air to create air to cool the water. Mechanical draft cooling towers use large fans to force air either through or across the water to cool it.

Regardless of the design, a small proportion of the cooling water is entrained in the updraft as mist, commonly called *drift*. When the water in the droplets evaporates, any dissolved solids in the cooling water form particulate matter.¹

When heat exchanger leaks occur (from process fluids leaking into cooling water), the volatilization of hydrocarbons and/or TACs in the contaminated cooling water lead to emissions. Such leaks tend to occur when heat exchanger tube sheets fail or when tubes rupture as a result of corrosion or the use of inferior materials during the exchanger construction process.

Heat exchangers usually do not leak, but when there are mechanical failures in the sheets or tubes, the emissions can be very high. In 2010 a heat exchanger leak at a Bay Area refinery resulted in emissions of at least 52 tons of THC over a recorded period of 16 days. The total magnitude of emissions from the leak event was probably much greater; emissions from the event were only estimated once the leak was detected, which was likely at least several weeks after the leak began.

Regulatory History and Context

District Regulation 11, Rule 10 was developed in 1989 to reduce hexavalent chromium emissions from cooling towers.

In 2009, The U.S. Environmental Protection Agency (EPA) promulgated, and in 2013 amended, 40 CFR part 63, subpart CC, *National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries*

¹ Cooling tower water frequently contains additives such as biocides, anti-foaming agents and anti-scaling agents, any of which could be emitted as particulate matter

(MACT² CC). Section 63.654 in MACT CC requires periodic monitoring (monthly or quarterly) of heat exchangers in organic hazardous air pollutant (HAP) service.³

MACT CC requires leaks to be repaired as soon as practicable after they are discovered but no later than 45 days after detecting the leak, unless the repair is not feasible. Not all cooling towers are subject to the monitoring, leak, and repair requirements of MACT CC.⁴

Cooling Tower Emissions have also been addressed by the Texas Commission on Environmental Quality (TCEQ). The TCEQ developed Chapter 115 – Control of Air Pollution from Volatile Organic Compounds, SUBCHAPTER H: HIGHLY-REACTIVE VOLATILE ORGANIC COMPOUNDS to address Highly Reactive Volatile Organic Compound (HRVOCs) emissions from industrial cooling towers. This was part of an overall strategy to address spikes in ozone concentrations around the Houston Ship Channel. This rule requires the continuous monitoring of cooling towers that may leak HRVOCs. The monitors must meet a detection limit of 50 parts per billion by weight (ppbw).

PROPOSED AMENDMENTS

Elements to be added to Regulation 11, Rule 10 are as follows:

1. THC leak monitoring, repair and minimization requirements for petroleum refinery cooling towers will be incorporated into an existing regulation that was adopted in 1989 to limit hexavalent chromium emissions from all Bay Area cooling towers that were subject to the provisions of the rule. The regulation's description will be modified to include THC emissions from petroleum refinery cooling towers.
2. Regulation 8, Organic Compounds, Rule 2: *Miscellaneous Operations* exempts cooling tower emissions provided "best modern practices" are used. Regulation 11, Rule 10 will define "best modern practices" and will require refinery staff to take steps to ensure heat exchanger equipment is kept corrosion free and in good working order; to make visual and odor inspections on a regular basis; to perform surrogate testing, such as residual chlorine measurements every shift, and to track the amount of biocide added to cooling tower water on a daily basis to maintain water chemistry. Refinery cooling towers that comply with best modern practice requirements in Regulation 11-10-4-2 will qualify for the exemption in Regulation 8-2-114 and, therefore, will qualify for the 15 lb/day requirement in Regulation 8-2-301.
3. The regulation will require each cooling tower to use one of three options to monitor cooling tower water hydrocarbon concentrations on a daily basis. Cooling towers that circulate less than 2,500 gallons per minute of cooling water will be allowed to monitor weekly, and any cooling towers that circulate less than 500 gallons per minute of cooling water will be allowed to monitor once every 14 days.
4. The regulation will include a THC concentration standard of 84 ppb (by weight) when cooling tower water is sampled for lab analysis. The THC concentration standard will be 6 ppm (by volume) when cooling tower water is monitored by a continuous analyzer or the use of an APCO approved alternative monitoring method. When the THC standard for any of the three allowable monitoring methods is exceeded, a leak action response will be required.

² "MACT" stands for Maximum Achievable Control Technology, which is the level of control that the emission standards regulation is intended to achieve.

³ The EPA rule exempts heat exchangers that are designed to make leaks nearly impossible due to pressure differences or intervening fluids.

⁴ Applicability criteria can be found in Section 63.654.

5. The refinery shall be required to minimize the leak within 5 calendar days and shall repair the leak within 21 days.
6. For leaks that cannot be repaired within 21 calendar days, the refinery would have to speciate and quantify THCs associated with the leak in order to ensure mass emissions are below 15 pounds per calendar day and the hourly and annual (if applicable) TAC emissions are below their corresponding acute and/or chronic trigger levels in Table 2-5-1 of Regulation 2, Rule 5.
7. Regulation 11, Rule 10 would also include detailed recordkeeping requirements.

Staff proposes that the new requirements in Regulation 11, Rule 10 go into effect on July 1, 2016

The refinery operators have been monitoring most of these cooling towers using a test method called the Modified El Paso Method (MEPM), as required under the EPA rules. The Air District will allow the MEMP sampling method to be used as an APCO approved method, one of three possible THC detection methods, provided the petroleum refineries follow the Air District's Manual of Procedures methodology that will update the MEPM in May of 2016 prior to the July 1, 2016 the effective date for these amendments to Regulation 11, Rule 10. A second method of THC detection Regulation 11, Rule 10 will allow is the use of water sampling with appropriate laboratory analysis. It is a very accurate THC detection method providing water samples are taken properly to protect the integrity of the sample and providing the correct lab analysis methodologies are used. The third method that petroleum refineries may use to detect THC in cooling tower water is the use of a continuous hydrocarbon analyzer.

Regulation 8, Rule 2, Section 114 states that "Emissions from cooling towers, railroad tank cars, marine vessels and crude oil production operations are exempt from this Rule, provided best modern practices are used." Regulation 1, Section 207 defines *best modern practices* in general as "The minimization of emissions from equipment and operations by the employment of modern maintenance and operating practices used by superior operators of like equipment and which may be reasonably applied under the circumstances."

Regulation 11, Rule 10 is now proposing a cooling tower-specific definition. In the draft rule, staff has compiled examples of best practices from several sources.

Control Mechanisms

No add-on controls are proposed; only frequent monitoring and rapid leak detection, minimization, and repair.

AREAS OF CONTROVERSY

In their written comments and presentations to the Board, refinery operators state that the cooling towers are well controlled and do not pollute enough to justify this rule amendment. The refinery operators have been monitoring most of these cooling towers using the MEPM. Some refiners have been using older continuous monitors and Phillips uses monthly water sampling. Based on those test results, the refineries comment that their cooling towers do not appear to be leaking significantly. The refinery operators contend that the costs of the more rigorous and frequent testing in this proposed amendment are not justified by the potential emission reductions. Furthermore, the refinery operators contend that it is not reasonable to expect them to repair leaks more quickly than required by the EPA rules.

Air District staff have concerns about the accuracy and reliability of the MEPM and the existing continuous monitors. In our technical opinion, the information provided by these methods is not sufficiently complete or reliable to detect all of the types of leaks that may be occurring and that this rule amendment is intended to address. In addition, Air District staff believe that leaks should be detected and fixed more quickly. Under the EPA requirements, a leak could go undetected for 30 days and then take 45 days to repair. Extending the example of the 2010 Bay Area refinery cooling tower leak, a 75 day leak could result in over 240 tons of emissions. Under this amendment, leaks will be detected in one day and repaired within 21 days.

The MEPM was developed by the TCEQ and adopted by EPA in their MACT rules. In both cases, it was designed to concentrate on the measurement of strippable hydrocarbons, compounds with lower molecular weights and boiling points. When the MEPM is utilized, a continuous stream of cooling water is sampled directly into an air stripping column apparatus. Air flowing countercurrent to the cooling water strips HRVOCs from the water for analysis.

The Air District's staff is concerned about the MEPM sampling method's ability to provide representative, accurate, precise and repeatable hydrocarbon emissions data on a consistent basis. There are three main concerns about the method. First, the specifications for appropriate sampling equipment and requirements for zero and span performance are incomplete or lack specificity, which could lead to the test not being accurate enough to measure at the levels required to detect leaks. Second, the method does not perform well for all compounds of concern. It is well suited to the principal compounds of concern to the TCEQ and the EPA but does not provide adequate response for all of the toxic and reactive compounds of concern to the Air District. Third, the method is not sufficiently specified, meaning that it could be performed in a way that gave a result that cannot be repeatedly obtained by others utilizing the same set of instructions.

Given all these concerns, Air District staff does not believe that the MEPM provides sufficient evidence that the cooling towers are well controlled and is therefore preparing a revised MEPM for inclusion in the District's Method of Procedures.

The MEPM was designed to address issues with direct water analysis where improper sampling techniques can severely impact leak detection or the use of an inappropriate analytical method can affect the type of compounds identified. The Air District addresses these issues with direct water analysis by requiring specific methods for sample collection and analysis.

Similarly, the continuous monitors in use at some of the refineries are not sufficiently precise and/or accurate for a wide enough range of compounds to provide results that demonstrate the cooling towers are well controlled.

With the exception of Phillips, Air District staff finds that the refineries do not have sufficient information to demonstrate that the cooling towers are not leaking in excess of the concentrations specified in this rule amendment. It is important to note that while Phillips does have sufficient information regarding compound concentration, the monitoring schedule they utilize would allow leaks to occur for a far greater time period than what staff believes would provide adequate control of potential emissions. Therefore, staff are using an EPA emission factor appropriate for cooling towers that are not well controlled when estimating the emission reductions associated with this rule, as discussed below.

The principal benefit of the rule will be to ensure that leaks, even small ones, are detected and repaired as quickly as possible. The Air District staff are recommending a regulatory regime that is most protective air quality. The socioeconomic analysis has demonstrated that the costs are not significant when compared to the potential emissions reductions and refinery profits.

EMISSIONS AND EMISSIONS REDUCTIONS

Emissions

There are five petroleum refineries within the Air District's jurisdiction that operate a total of 32 permitted cooling towers. The number of cooling towers per facility varies. One refinery has only one cooling tower while another has 13 permitted cooling towers. Based on the 2015 Air District emissions inventory, the cooling towers collectively emitted approximately 2.7 tons per day (TPD) of organic gases (978 tons per year), estimated using AP-42 emission factors for four of the refineries and emissions from water analysis data from the fifth refinery.⁵

As described above, there are many issues involved with current emissions measurement techniques used at the cooling towers. While many facilities are utilizing the MEPM, there are concerns regarding the accuracy and repeatability of the method as currently applied. Other facilities are using water sampling methods where proper sample collection techniques are critical to ensure accurate and repeatable analytic results and analysis methods for those samples is critical to ensure all relevant compounds are identified. In some instances, facilities may only be testing for easily strippable hydrocarbon compounds.

In absence of reliable data on current emissions from refinery cooling towers, it is common practice for the Air District to look to EPA emission factors. There are two EPA emission factors that could be applied: one is for well controlled cooling towers and one is for uncontrolled cooling towers. While current emissions may be lower than those calculated using the uncontrolled AP-42 emission factor, they are likely higher than the controlled factor due to the deficiencies in the current monitoring techniques discussed above. In order to take a more conservative approach, staff has used the higher emission factor in the above calculation.

The Air Districts' 2015 emissions inventory provides the Air District's best estimate of the rate at which refinery cooling towers are currently leaking. The refiners developed their own estimates when developing information for the EPA's Information Collection Request (ICR) as the EPA was preparing to update MACT rules applicable to the refineries. Some of the refiners submitted information to the Air District during this rulemaking process stating that their emissions are lower than they recently reported to EPA. These emissions estimates submitted in comments on the rulemaking are based on methods that are not reliable for the reasons listed above. These estimates assume that the cooling towers are well controlled, which cannot be justified by the available data and which conflict with information submitted to the EPA for the ICR by the refineries themselves.

Table C:2 compares the 2015 Air District emissions inventory to the data provided to EPA by the refineries.

⁵ AP-42, *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources*, Fifth Edition, April 2015, Table 5.1-3

**Table C2
Estimated Current Emissions**

Facility	BAAQMD Estimate (tpy)	ICR Data (tpy)
Chevron	279	353
Shell	258	183
Tesoro	354	21
Phillips 66	3	0.43
Valero	84	91
TOTAL	978	648

Air District staff do not believe that the ICR data for Phillips is accurate, given that the 3 tpy estimate in the BAAQMD inventory is based on water sampling.

Emissions Reductions

The amended rule will require that the refineries ensure that total hydrocarbons in the cooling tower water do not exceed 84 ppbw. This 84 ppbw limit translates into an emission rate of 0.7 lbs of hydrocarbons emitted for every million gallons of recirculated water. Through this calculation, staff estimated that the overall THC emissions would be reduced by approximately 88 percent by these rule amendments.

Table C3 lists the estimated emissions reductions from the implementation of the proposed amendments to Rule 11-10. It provides estimates based on staff's estimated baseline emissions and similar data provided by the refineries to EPA as part of the ICR.

**Table C3
Estimated Emissions Reductions**

Facility	BAAQMD Estimate (tpy)	ICR Data (tpy)
Chevron	245	311
Shell	227	161
Tesoro	312	18
Phillips 66	3	n/a
Valero	74	80
TOTAL	861	570

Given the likely inaccuracy of the ICR data for Phillips, staff are not confident providing an estimated emission reduction for that refinery, based on the ICR data.

COST EFFECTIVENESS

Rule 11-10 specifies three options for hydrocarbon monitoring: daily water sampling (currently used by one refinery for all cooling towers), use of continuous analyzers (currently used only at two individual cooling towers in the Bay Area), or use an improved version of the MEPM. Air District staff has estimated that the most costly option is for a refinery to perform daily water sampling and analysis using

contractors because of the high per-sample cost. The next most-expensive option is installation of dedicated analyzers at each cooling tower because of the high capital cost. The least expensive option is use of refinery staff to perform the MEPM with required sampling and analytical equipment. The MEPM option is the least expensive because the sampling and analysis systems have a low capital cost and the use of refinery staff limits labor costs.

Since costs can vary by refinery depending on the number of cooling towers and the pre-existing monitors, this report provides detailed costs on all three options. Refinery operators are free to select the option that best fits their unique situation.

Table C:4a – Fixed Continuous Analyzers

Refinery	Capital Cost (\$)	Operating Cost (\$/year)	Total Annual Cost (\$/year)	BAAQMD Cost Effectiveness (\$/ton reduced)	ICR Cost Effectiveness (\$/ton reduced)
Chevron	1,875,000	50,000	305,000	1,243	982
Phillips 66	2,100,000	50,000	335,000	122,625	n/a
Shell	375,000	25,000	76,000	335	472
Tesoro	3,900,000	50,000	580,400	1,861	31,407
Valero	300,000	25,000	65,800	889	822
Total Cost	8,550,000	200,000	1,362,800		
Average Cost Effectiveness				1,393	2,388

Table C:4a addresses the continuous monitoring option and assumes that each new analyzer and shelter costs \$300,00 to acquire and install. This cost estimate addresses the potential use of intrinsically safe shelters that may be required in some cases. The refinery operators estimated the costs of such shelters to be between \$500,000 and \$1,000,000. The Air District does not believe that every monitor will require an intrinsically safe shelter. The \$300,000 estimate is intended to be a mix of normal shelters and intrinsically safe ones. For refineries that already have a monitor installed. This cost estimate assumes that a modern monitor will be required for a capital cost of \$75,000 installed. This is consistent with information provided by vendors of monitors that meet the requirement of the rule. Capital costs are recovered at a rate of 13.6 percent a year. This is consistent with a 10-year life span and 6 percent cost of capital, as per usual Air District cost calculations. The cost estimate also assumes \$25,000/yr labor cost for up to 5 cooling towers, with an additional \$25,000/yr for facilities with more than 5 cooling towers.

Table C:4b – In House Modified El Paso Method

Refinery	Capital Cost (\$)	Operating Cost (\$/year)	Total Annual Cost (\$/year)	BAAQMD Cost Effectiveness (\$/ton reduced)	ICR Cost Effectiveness (\$/ton reduced)
Chevron	50,000	200,000	206,800	742	666
Phillips 66	50,000	200,000	206,800	66,495	n/a
Shell	50,000	200,000	206,800	802	1,284
Tesoro	75,000	300,000	310,200	875	16,786
Valero	50,000	200,000	206,800	2,459	2,582

Total Cost	275,000	1,100,000	1,137,400		
Average Cost Effectiveness				1,163	1,993

Table C:4b provides information on the use of the MEPM and assumes one sampling system for up to 5 cooling towers, two systems for up to 10 towers and 3 for more than 10. It also assumes \$25,000 capital cost for each system. Capital costs are recovered at a rate of 13.6 percent a year. The cost estimate also assumes \$100,000/yr for labor and lab analysis costs.

Table C:4c – Outside Contractor Daily Sampling and Analysis

Refinery	Capital Cost (\$)	Operating Cost (\$/year)	Total Annual Cost (\$/year)	BAAQMD Cost Effectiveness (\$/ton reduced)	ICR Cost Effectiveness (\$/ton reduced)
Chevron	0	518,800	518,800	1,861	1,670
Phillips 66	0	401,500	401,500	129,100	n/a
Shell	0	245,050	245,050	950	1,522
Tesoro	0	839,500	839,500	2,369	45,427
Valero	0	182,500	182,500	2,170	2,279
Total Cost	0	2,187,350	2,187,350		
Average Cost Effectiveness				2,236	3,833

Table C:4c addresses the water sample collection and laboratory analysis option and reflects an assumption that the first daily sample will cost \$500 and subsequent samples that same day will cost \$150. This is consistent with recent Air District use of private laboratories. The cost estimate also accounts for the fact that not all towers will require daily sampling. There are no capital costs associated with this option.

The Air District finds that the average cost effectiveness is reasonable for each option. This is true whether one uses the Air District's estimate or the estimate based on the data submitted by the refineries to the ICR. For refineries with low baseline emissions, the costs appear high. This is a particular issue with the Phillips 66 refinery, given their low baseline emissions estimate. But, there is no guarantee that the Phillips 66 cooling towers will continue to leak at the low rate shown in this inventory. Given that the Phillips cooling towers are currently sampled monthly, the early detection requirements in this rule amendment could avoid 29 days of leaks. If the leak were as large as the 2010 Bay Area refinery cooling tower leak, that would prevent 94 tons of emissions. If one such leak was avoided per year at Phillips, the cost effectiveness would be \$4,271/ton.

Incremental Cost Effectiveness

Under Health and Safety Code section 40920.6, the Air District is required to perform an incremental analysis when adopting a Best Available Retrofit Control Technology (BARCT) rule or feasible measure required by the California Clean Air Act. To perform this analysis, the Air District must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness of each option.

Three options were considered for the cost analysis, and incremental cost effectiveness analysis. Option 1 is for daily water sampling and testing, and is the highest cost. Option 2 is for installation and use of continuous monitoring and was considered with two sensitivity cases – one where a typical analyzer shelter is required, and a second where the shelter is twice the cost because of a unique location and/or utilities not being readily accessible. Option 3 is the lowest cost – using the Air District’s improved version of the MEPM to monitor for total hydrocarbons.

All three options are found to be cost effective. The cost effectiveness of the highest cost daily sampling and testing is well within typical cost effectiveness guidelines. The other two options are equally will within typical cost effectiveness guidelines. However, incremental cost effectiveness analysis of either daily sampling or continuous analyzers for small cooling towers were found to not be cost effective. This analysis resulted in a requirement for weekly sampling for cooling towers with less than 2,500 gallons per minute circulation rates, and sampling every 14 days for cooling towers with less than 500 gallons per minute circulation rates.

Socioeconomic Impacts

As required by the California Health and Safety Code, a thorough socioeconomic analysis of the impacts of the proposed amendments to Rule 11-10 is presented in Appendix E.

REGULATORY IMPACTS

Section 40727.2 of the California Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and air district air pollution control requirements for the equipment or source type affected by the proposed change in air district rules. The air district must then note any differences between these existing requirements and the requirements imposed by the proposed change. The following table (Table C5) provides a comparison of the proposed amendments to related provisions from other air quality regulations affected cooling towers at refineries.

Table C5
Regulation 11, Rule 10, Section 40727.2 Analysis

Section	Description (paraphrased)	Comparable State/District Rules	Comparable Federal Rules	Discussion
101	Description	NA	NA	No applicable requirements
103 - 107	Exemptions for certain pieces of equipment	NA	NA	No applicable requirements
201 – 211	Definitions	NA	NA	No applicable requirements
301	Standards: Effective March 1, 1990, prevents the use of Cr6 chemicals		40 CFR 63, Subpart Q	Prevents the use of chromium-based water treatment chemicals in Industrial Process Cooling Towers
304	Standards: Effective July 1, 2016, provides Bay Area refinery owner/operators with the following three monitoring options to check for total hydrocarbon (THC) leaks in cooling towers (closed-loop recirculation systems): <ul style="list-style-type: none"> • Continuous THC analyzer monitoring; or • Direct grab sampling and lab analysis of THC in cooling water; or • APCO approved alternative THC monitoring method 		40 CFR 63, Subpart CC (MACT CC) - 63.654 Provides owners/operators of heat exchange systems (closed-loop recirculation and once-through) the option of monitoring for total strippable volatile organic compounds (VOC) concentration via the Modified El Paso Method (MEPM) on a monthly or quarterly basis. Heat exchange (HEX) systems constructed/reconstructed after August 18, 1995 and before September 4, 2007 are considered "existing" sources and are required to come into compliance with applicable requirements on/before October 29, 2012. HEX systems constructed on/after September 4, 2007 are considered "new" sources and are required to come into compliance upon initial startup or October 28, 2009 whichever is later.	Reg. 11-10 vs. MACT CC: <ul style="list-style-type: none"> • Reg. 11-10 addresses THC leaks from all cooling towers regardless of if they are in organic HAP service or not. • Reg. 11-10 has more frequent monitoring: Continuous/daily/weekly vs. monthly/quarterly • In Reg. 11-10, concentration of THC in cooling water determined via Method 8260/8270 vs. Concentration of total strippable VOC in stripped air determined via MEPM. • Delay of repair action level: None in Reg. 11-10 vs. 62 ppmv in MACT CC.

Section	Description (paraphrased)	Comparable State/District Rules	Comparable Federal Rules	Discussion
305	Standards: Effective July 1, 2016, Bay Area refinery cooling tower owners/operators that exceed the THC leak action levels of 84 ppbw (existing) or 42 ppbw (new/modified) in water, or 6 ppmv in stripped air, will have to minimize the leak within 5-calendar days and repair/remove the defective piece of equipment from service within 21-calendar days.		MACT CC – 63.654: Requires the leak to be repaired within 45-days if technically feasible; if technically infeasible allows repair to be delayed until next scheduled heat exchange system (HEX) shutdown; if technically feasible but parts/personnel not available, allows repair to be delayed for 120-days.	Reg. 11-10 vs. MACT CC: <ul style="list-style-type: none"> Unlike MACT CC, Reg. 11-10 does not contain a delay of repair action level. Therefore, the leak has to be minimized/repared ASAP. Though not explicitly stated in the rule, Bay Area refinery cooling tower owners/operators can request reprieve (variance, Compliance & Enforcement Agreement, etc.) if leaks cannot be fixed due to technical infeasibility and/or if parts/personnel are unavailable.
401	Reporting: Requires Bay Area refinery cooling tower owners/operators to follow notification procedures if continuous/daily/alternative monitoring determines the THC leak action of 84 ppbw (existing) or 42 ppbw (new/modified) is exceeded as discussed below.		MACT CC – 63.655	See more detailed sections below
401.1	Requires Bay Area refinery cooling tower owners/operators to notify the APCO within 1-calendar day if THC leak action levels of 84 ppbw (existing) or 42 ppbw (new/modified) is exceeded	NA	MACT CC – 63.655	Reg. 11-10 requires notification to be substantiated with info on: <ul style="list-style-type: none"> pH, iron, and chlorine concentration in cooling water associated with leak; date and time when leak was discovered; list of all HEXs served by the cooling tower.
401.2	Requires Bay Area refinery cooling tower owners/operators to provide additional information if an identified leak is not repaired within 21 days	NA	MACT CC – 63.655	Reg. 11-10 requires notification to be substantiated with info on: <ul style="list-style-type: none"> Leak specifics (extent, repairs, re-inspection, further actions/potential delays in repairs)
402	Best Modern Practices (BMP): Requires Bay Area refinery cooling tower owners/operators to minimize THC leaks from cooling towers by employing BMP. Records of collected data are to be maintained for at least 5 years and analyzed in a weekly report.		NA	No similar existing requirement
402.1	Visual examination or non-destructive examination of heat exchangers upstream of each cooling tower.	NA	NA	No similar existing requirement
402.2	Re-passivate steel within HEX's during turnaround.	None	None	No similar existing requirement
402.3	Seal tubes within HEX's if pitted/corroded.	None	None	No similar existing requirement
402.4	Perform visual observations once per shift to detect changes in cooling water appearance and algae growth.	None	None	No similar existing requirement

Section	Description (paraphrased)	Comparable State/District Rules	Comparable Federal Rules	Discussion
402.5	Monitor cooling tower decks once per shift for odors.	None	None	No similar existing requirement
402.6	Measure residual chlorine in cooling water once per shift.	None	None	No similar existing requirement
402.7	Monitor the air above cooling water once per shift with District approved hand-held monitors (~FIDs, etc.).	None	None	No similar existing requirement
402.8	Measure ORP in cooling tower water once per shift.	None	None	No similar existing requirement
402.9	Track and record the quantities of chlorine/biocide added every day.	None	None	No similar existing requirement
504	Monitoring and Records: Requires Bay Area refinery owners/operators to retain cooling tower operating records collected per Sections 301, 304, 305, 401, 402, and 602 for at least five years from the date of entry.	Regulation 2-6-501, 503	40 CFR 70.6(a)(3)(ii)	This requirement is similar to the recordkeeping requirement in the Air District's Major Facility Review (~Title V permit) Reg. 2, Rule 6 which is based on 40 CFR Part 70 "State Operating Permit Programs".
601	Analytic method for hexavalent chromium.	NA	NA	Administrative requirement
602	Installation locations of THC analyzers..	NA	NA	Administrative requirement
603	Specifies EPA methods to be used if Bay Area refinery cooling tower owners/operators choose to monitor for THC in cooling water by direct grab sampling followed by lab analysis to demo compliance with the THC leak action level.	NA	NA	Administrative requirement
604	Specifies sampling location (cooling water return line) to be used if Bay Area refinery cooling tower owners/operators choose to monitor for THC in cooling water by direct grab sampling followed by lab analysis to demo compliance with the THC leak action level.	NA	NA	Administrative requirement

Review of this information concludes that the proposed regulation is necessary to achieve the emission reductions anticipated, and is not duplicative of existing requirements.

ENVIRONMENTAL IMPACTS

As required by the California Environmental Quality Act (CEQA), a thorough analysis of the environmental impacts of the proposed amendments to Rule 11-10 is present in Appendix D. No environmental impacts beyond reduction of hydrocarbon emissions from cooling towers is expected, so a Negative Declaration is recommended.

MINOR CHANGES FROM THE PROPOSED RULE

The Air District posted a proposed version of Regulation 11, Rule 10 on October 23, 2015. The final version of the rule includes a few minor changes intended to clarify the intent of the rule.

1. Clarification: A short phrase was added to Section 11-10-305 to make it clear that the chemical speciation requirement is a daily requirement upon the discovery of a leak.
2. Clarification: To make it clear that it was never the Air District's intent to subject cooling towers that service heat exchangers with process fluids that do not contain hydrocarbons to the rule, an exemption (Section 11-10-107) was incorporated.
3. Clarification: In the introductory sentence in Section 11-10-205, the word "shall" was changed to "may" to make it clear that actions in either 205.1 or 205.2 are allowable as methods to repair leaks.

CONCLUSION

The proposed amendments to Regulation 11, Rule 10 will result in significant reduction of THC emissions. The CEQA analysis found there to be no additional significant environmental impacts expected from these requirements, and the Socio-Economic analysis found no significant impact on refineries or other processing plants with cooling towers in hydrocarbon service.



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

STAFF REPORT

PROPOSED
AIR DISTRICT REGULATION 12, RULE 15:
PETROLEUM REFINING EMISSIONS
TRACKING

Prepared by the staff of the
Bay Area Air Quality Management District
April 2016

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Appendices:

- Appendix A: Proposed Regulation 12, Rule 15
- Appendix B: Air Monitoring Guidelines for Petroleum Refineries
- Appendix C: Socio-Economic Analysis
- Appendix D: Regulatory Impacts Analysis
- Appendix E: CEQA Initial Study / Negative Declaration

Acknowledgements

EXECUTIVE SUMMARY

Bay Area refineries are among the largest stationary sources of air pollutants—criteria, toxic, and climate—in the region. Refineries process crude oil into various products, such as gasoline, diesel fuel, jet fuel, heating oil, and asphalt. Changes in the crude oil stock being processed in Bay Area refineries, along with other factors, can cause an increase in the air emissions of these pollutants. Also, refineries must be a key contributor to greenhouse gas (GHG) reductions necessary to successfully implement the state's climate change goals. As a result, the Bay Area Air Quality Management District ("Air District") has developed a new proposed rule: *Regulation 12, Rule 15: Petroleum Refining Emissions Tracking ("Rule 12-15")*.

Proposed Rule 12-15 would require that all refineries:

1. Submit consistent, enhanced periodic emissions inventory information, including information about cargo carriers;
2. Make available to the APCO historic and ongoing crude slate information, including volumes and composition data, for imported feedstocks as well as for crude oil; and
3. Install and operate new air monitoring facilities at refinery fence-lines.

These activities and the information they would provide would address the Air District goals to:

1. Accurately and fully characterize emissions of air pollutants (criteria, toxic, and climate) from all refinery-related emissions sources on an on-going basis to determine if additional rule development is required to further reduce emissions;
2. Track crude slate changes to assess whether those changes result in increased emissions
3. Improve real-time monitoring of emissions at refinery fence-lines to address public concerns about localized health impacts and to validate emissions inventories.

I. INTRODUCTION

This report was prepared to provide information about the development of a new rule by the Bay Area Air Quality Management District ("Air District") that would apply to petroleum refineries located in the San Francisco Bay Area: *Regulation 12, Rule 15: Petroleum Refining Emissions Tracking ("Rule 12-15")*. The development of this rule 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.

In the development of this proposed rule, the Air District held several workshops to discuss the draft rule and gather stakeholder input. An initial series of public workshops were held on an earlier draft Rule 12-15 in Martinez on April 22, 2014; Richmond on April 24, 2014; and at the Air District offices on April 26, 2014. The Air District held a second series of workshops in Benicia on March 16, 2015; Richmond on March 17, 2015; Martinez on March 18, 2015; and at the Air District offices on March 20, 2015. At these workshops, staff presented and discussed a revised draft Rule 12-15 as well as guidance documents for air monitoring and developing emissions inventories. During these workshops, draft Rule 12-15 was presented as a companion to draft *Regulation 12, Rule 16; Petroleum Refining and Emissions Limits and Risk Thresholds ("Rule 12-16")*, which included emission-mitigation actions triggered in various ways.

The Air District hosted three open house events in September 2015, in Martinez, Benicia and Richmond. Although these events were focused on four different draft refinery rules, draft Rule 12-15 and draft Rule 12-16 were discussed with members of the public and the regulated community.

The Air District posted an amended version of draft Rule 12-15 and the air monitoring guidance as well as an interim Staff Report on September 11, 2015. (Also, see Section IX, Rule Development and Public Consultation Process, below.)

At this time, draft Rule 12-16 is being reassessed, and the elements in draft Rule 12-15 that were designed to explicitly support provisions of draft Rule 12-16 have been removed from proposed Rule 12-15.

II. BACKGROUND

A. Bay Area Petroleum Refineries and Support Facilities

Currently, the five petroleum refineries located in the Bay Area within the jurisdiction of the Air District that would be affected by the proposed rule are:

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)

The five affected, refinery-related facilities ("Support Facilities" in the proposed rule) are:

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 subject to some provisions of the rule because their operation is closely linked to the operations of the five refineries and because they are significant sources of air pollutants.

1. Petroleum Crude Oil

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, a variety of toxic compounds, organic acids, and metals (e.g., iron, copper, nickel, and vanadium). Crude oil is most often characterized by the oil's density (light to heavy) and sulfur content (sweet to sour). A more detailed explanation of these terms and others used to describe crude oil follows below.

Also, each of the properties described below, with the exception of "crude oil fractions", "nitrogen content," "total reduced sulfur," and "total acid number" are required to be included in the periodic Crude Slate Report described in proposed Rule 12-15. The District may consider adding these or other properties to Rule 12-15 in a future

amendment, if the data indicates that these properties are essential to fully understanding the emissions impact of crude slate changes.

a. Crude oil fractions

Crude oil is not a single substance but rather is a mixture of substances (hydrocarbons, water, metals, mineral salts, and sediments). Hydrocarbons are organic compounds composed of carbon and hydrogen atoms. Crude assays characterize petroleum fractions by boiling point ranges.

b. API Gravity

The industry standard measure for crude oil density is American Petroleum Institute (API) gravity, which is expressed in units of degrees, and which is inversely related to density (i.e., a lower API gravity indicates higher density; a higher API gravity indicates lower density). Refineries convert crude oils to gaseous products (propane gas for sale and "fuel gas" that is consumed at the refinery), high-value transportation fuels (gasoline, diesel and jet fuel) and lower-value heavy oils (such as "bunker fuel" that is used by ocean-going vessels). Crude oils with higher API gravity can theoretically be converted to higher-value light products with less processing than crude oils with lower API gravity. Refinery operators have asserted that, although this may suggest that a refinery operator would prefer to use high API gravity crudes exclusively, this is not the case because each refinery is designed and equipped to process crude oil with API gravity in a certain range. Processing crude oil outside of the design range—even if it is "light" crude—will result in processing bottlenecks that reduce the overall efficiency of the refinery. One of the purposes of proposed Rule 12-15 is to gather information to attempt to determine if changes in crude oil composition result in emissions increases. "Light crude" generally refers to crude oil with API gravity of 38 degrees or more; "medium crude" has API gravity between 29 and 38 degrees; and "heavy crude" has API gravity of 29 degrees or less.

c. Sulfur Content ("Sweet" and "Sour" Crude)

Sulfur is an impurity that occurs in crude oil and arrives in various forms including: elemental sulfur (S), hydrogen sulfide (H₂S), carbonyl sulfide (COS), inorganic forms, and most importantly organic forms that include: mercaptans, sulfides, and polycyclic sulfides. "Sweet crude" is commonly defined as crude oil with sulfur content less than 0.5 percent, while "sour crude" has sulfur content greater than 0.5 percent. Sweet crude is more desirable because sulfur must be removed from the crude oil to produce more valuable refined products such as gasoline, diesel and aviation fuels.

d. Nitrogen Content

Nitrogen in the heavy gas oil component of crude oil is a contaminant that often requires additional processing. Nitrogen can poison catalysts used in hydrotreating and cracking processes; therefore, nitrogen removal often results in better gasoline and distillate product yields.

e. Vapor Pressure

Vapor pressure is a measure of crude oil volatility. Higher vapor pressure crude oil contains greater amounts of light Volatile Organic Carbon (VOC) compounds.

f. Total Reduced Sulfur (Hydrogen Sulfide and Mercaptans) Content

Total reduced sulfur (hydrogen sulfide and mercaptan content) is a measure of the highly odorous volatile components in crude oil.

g. BTEX (Benzene, Toluene, Ethylbenzene, Xylene) Content

BTEX content is a measure of the benzene, toluene, ethylbenzene, and xylene content in crude oil.

h. Total Acid Number

Total Acid Number is a measure of the quantity of organic acids in the crude oil.

i. Metals (Iron, Nickel and Vanadium) Content

The metals content of crude oil indicates both the solids contamination of crude oil and the potential for organic metals compounds in the heavy gas oil component of crude oil.

2. Petroleum Refining Processes

Refineries comprise the general processes and associated operations discussed below.

a. Separation Processes

Crude oil consists of a complex mixture of hydrocarbon compounds with small amounts of impurities such as sulfur, nitrogen, and metals. The first phase in petroleum refining is the separation of crude oil into its major constituents using distillation and "light ends" recovery (i.e., gas processing) that splits crude oil constituents into component parts known as "boiling-point fractions."

b. Conversion Processes

To meet the demands for high-octane gasoline, jet fuel, and diesel fuel, components such as residual oils, fuel oils, and light ends are converted to gasoline and other light fractions by various processes. These processes, such as cracking, coking, and visbreaking (a form of thermal cracking that breaks the viscosity), are used to break large petroleum molecules into smaller ones. Polymerization and alkylation processes are used to combine small petroleum molecules into larger ones. Isomerization and reforming processes are applied to rearrange the structure of petroleum molecules to produce higher-value molecules using the same atoms.

c. Treating Processes

Petroleum treating processes stabilize and upgrade petroleum products by separating them from less desirable products, and by removing other elements. Treating processes, employed primarily for the separation of petroleum products, include processes such as de-asphalting. Elements such as sulfur, nitrogen, and oxygen are removed by hydrodesulfurization, hydrotreating, chemical sweetening, and acid gas removal.

d. Feedstock and Product Handling

Refinery feedstock and product handling operations consist of unloading, storage, blending, and loading activities.

e. Auxiliary Facilities

A wide assortment of processes and equipment not directly involved in the processing of crude oil are used in functions vital to the operation of the refinery. Examples include boilers, wastewater treatment facilities, hydrogen plants, cooling towers, and sulfur recovery units. Products from auxiliary facilities (e.g., clean water, steam, and process heat) are required by most process units throughout a refinery. Note that as defined in proposed Rule 12-15, an operation such as a hydrogen plant that is not owned or under the operational control of the refinery would be deemed a “support facility.”

f. Cargo Carriers

While some crude oil is transported to refineries by pipeline, ships and trains also can be used to move large quantities of crude oil to refineries. Understanding these emissions provides a more complete picture of the environmental impact of the refinery operations.

g. Possible Changes in Emissions Due to Changes in Crude Oil

In the past several years, new sources of crude oil—including American shale oil and Canadian tar sands-derived oil—have become available to petroleum refineries in North

America, including the Bay Area refineries. The crude oil derived from shale, now accessible because of technological improvements in hydraulic fracturing ("fracking"), tends to be light and sweet. However, it also has higher VOC and H₂S content than some other crude oils. Crude oil from tar sands, currently under development in the Canadian province of Alberta, tends to be heavy and sour.

In order to maximize production, refineries are designed to process crude oils within a certain range in compositions. For example, a refinery that is designed to process more sour crude must have the capacity to remove large amounts of sulfur from the crude oil, while a refinery designed to process sweet crude does not require as much sulfur processing capacity. Bay Area refineries traditionally process heavier and more sour crude oils and would likely need to make changes to their facilities in order to accommodate different sources of crude oil with different compositions while maintaining current production levels.

It is anticipated that refineries will update and/or modify their equipment to meet stricter regulatory fuel requirements and potentially to process crude oil from different sources. Proposed Rule 12-15 provides a means to determine if overall changes in refinery emissions occur as both processes and equipment change, and to make emissions and new monitoring information available to the public.

3. Air Pollutants Emitted from Petroleum Refineries

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 pollutants (toxic air contaminants, which in federal programs are referred to as "hazardous air pollutants"); and (3) climate pollutants (e.g., greenhouse gases). Additional categories of air pollutants include odorous compounds and visible emissions, although these are most often also components of one or more of the three primary categories of regulated air pollutants listed above.

Criteria pollutants are emissions for which Ambient Air Quality Standards (AAQS) have been established, or they are atmospheric precursors to such air pollutants (i.e., they participate in photochemical reactions to form a criteria pollutant, such as ozone). The AAQS are air concentration-based standards that are established to protect public health and welfare. The U.S. Environmental Protection Agency (EPA) sets AAQS on a national basis (National Ambient Air Quality Standards, or NAAQS), and the California Air Resources Board (CARB) sets AAQS for the state of California (California Ambient Air Quality Standards, or CAAQS). Although there is some variation in the specific pollutants for which NAAQS and CAAQS have been set, the term "criteria pollutants" generally refers to the following:

- Carbon monoxide (CO);
- Nitrogen dioxide (NO₂) and oxides of nitrogen (NO_x);

- Particulate matter (PM) in two size ranges—diameter of 10 micrometers or less (PM₁₀), and diameter of 2.5 micrometers or less (PM_{2.5});
- Precursor organic compounds (POCs) for the formation of ozone and PM_{2.5}; and
- Sulfur dioxide (SO₂).

Each of these criteria pollutants is emitted by petroleum refineries.

Toxic pollutants, also known as toxic air contaminants (TACs), are emissions for which AAQS generally have not been established, but that nonetheless may result in human health risks. TACs generally are emitted in much lower quantities than criteria pollutants, and may vary markedly in their relative toxicity (e.g., some TACs cause health impacts at lower concentrations than other TACs). 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 (e.g., acetaldehyde, benzene, 1,3-butadiene, formaldehyde, and xylenes); semi-volatile and non-volatile organic TACs (e.g., benzo(a)pyrene, chlorinated dioxin/furans, cresols, and naphthalene); metallic TACs (e.g., compounds containing arsenic, cadmium, chromium, mercury, and nickel); and inorganic TACs (e.g., chlorine, hydrogen sulfide, and hydrogen chloride).

Climate pollutants (greenhouse gases or GHGs) are emissions that contribute to climate change. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and three groups of fluorinated compounds (hydrofluorocarbons, or HFCs; perfluorocarbons, or PFCs; and sulfur hexafluoride, or SF₆) are the major anthropogenic GHGs, and are regulated under the federal Clean Air Act and the California Global Warming Solutions Act (AB32). The climate pollutants emitted from petroleum refineries include CO₂, CH₄, and N₂O.

B. Regulation of Air Pollutants from Petroleum Refineries

1. Criteria Pollutants

Bay Area refineries are subject to various air quality regulations that have been adopted by the Air District, CARB, and the EPA. These regulations contain standards that ensure emissions are effectively controlled, including:

- Requiring the use of specific emission control strategies or equipment (e.g., the use of floating roofs on 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 SO₂ in exhaust gases from sulfur recovery units; 1,000 ppm by volume SO₂ 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_x per million BTU of heat input, on a refinery-wide basis, for boilers, process heaters, and steam generators);
- Requiring that emissions be controlled sufficiently so that concentrations beyond the facility's property are below specified levels (e.g., 0.03 ppm by volume of hydrogen sulfide [H₂S] 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 Smoke 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 is 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 or operational conditions contained in Air District permits. As a result, none of the Bay Area refineries have overall mass emission limits that apply to the entire refinery. Nonetheless, mass emissions of regulated air pollutants from Bay Area refineries are tracked at the source level, and these mass emissions generally have been substantially reduced over the past several decades.

Air pollutant emissions from Bay Area petroleum refineries have been regulated for more than 50 years, with most of the rules and regulations 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.

In December 2015, the Air District adopted two amended rules and one new rule that affect refinery operations and emissions:

- New Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs);
- Amended Regulation 8, Rule 18: Equipment Leaks;
- Amended Regulation 11, Rule 10: Cooling Towers

The Air District is considering additional revisions to several rules and the development of new rules that may further affect refinery operations and emissions. Rule amendments under development include:

- 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 9, Rule 1: Sulfur Dioxide; and
- Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines.

The Air District is also developing a new rule (Regulation 9, Rule 14) to address SO₂ emissions from petroleum coke calcining. Regulation 12, Rule 16 is being re-assessed. The Air District is considering alternative approaches to addressing the concern that refinery emissions may increase as the refineries adopt new sources of crude oil.

In addition, the Air District currently is developing an update to its Clean Air Plan that will investigate and evaluate further measures that could result in revised and/or new rules affecting refineries.

2. Toxic Pollutants

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) Preconstruction review; and (3) the AB 2588 Air Toxics "Hot Spots" Program.

a. Rules and Regulations

Many of the TACs emitted by petroleum refineries also result in the formation of criteria pollutants. For example, benzene and formaldehyde are precursor organic compounds to the formation of ozone, while arsenic and cadmium can be found in particulate matter emissions. 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 EPA, CARB, and Air District rules that specifically target toxic air contaminant emissions from sources at petroleum refineries, for example, the EPA's National Emission Standards for Hazardous Air Pollutants (NESHAPS) and CARB's Reducing Toxic Air Pollutants in California Communities Act (AB1807) Rules. Additional rules dealing with TACs are listed below.

b. 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. Regulation 2, Rule 5 includes health impact thresholds, which require the use of the best available control technology for TAC emissions (TBACT) for new or modified equipment, and established health risk limits that cannot be exceeded for any proposed project.

c. Air Toxics "Hot Spots" Program

The Air Toxic "Hot Spots" program, or AB 2588 Program, was a statewide program implemented by each individual air district pursuant to the Air Toxic "Hot Spots" Act of 1987 (Health and Safety Code [H&SC] Section 44300 *et seq.*). The Air District used standardized procedures to identify health impacts resulting from industrial and commercial facilities. Health impacts were expressed in terms of cancer risk and non-cancer (acute and chronic) hazard index.

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

An HRA conducted in accordance with AB 2588 estimates the health impacts from a site due to stationary source TAC emissions. The HRA must be conducted in accordance with statewide HRA guidelines developed by the Office of Environmental Health Hazard Assessment (OEHHA) in the Guidance Manual for Preparation of Health Risk Assessments. This manual includes health effects values for each TAC and establishes the procedures to follow for modeling TAC transport, calculating public exposure, and estimating the resulting health impacts. OEHHA periodically reviews and updates the Guidance Manual 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. The proposed revisions to the Guidance Manual were adopted March 6, 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; summarized in Table 1, 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. These thresholds as well as other methods to address and lower emissions or TACs are currently under review.

Table 1
Summary of Current Bay Area Air Toxics "Hot Spots" Program Risk Management Thresholds

	Site Wide Cancer Risk	Site Wide Non-Cancer Hazard Index
Public Notification	10 in a million	1.0
Mandatory Risk Reduction	100 in a million	10

3. Climate Pollutants

CARB recently adopted rules to reduce emissions of GHGs from mobile and stationary sources in California. All refineries in California are subject to CARB's Cap on Greenhouse Gas Emissions and Market-based Compliance Mechanisms ("Cap-and-Trade Rule"). The Cap-and-Trade Rule will reduce GHG emissions collectively from all subject sources using a market-based approach, although there is no requirement that any specific source reduce its emissions. The Cap-and-Trade system will reduce emissions from subject sources to 1990 levels by 2020, a roughly 15 percent reduction.

The Air District's recently adopted Ten Point Climate Action Work Program calls for enhanced GHG emissions inventory and forecasting, the implementation of GHG emissions monitoring and additional rule development specifically addressing GHG emissions; all of which will affect the five Bay Area refineries and support facilities.

4. Accidental Release Regulation

In addition to Air District regulations, petroleum refineries are also subject to regulatory programs that are intended to prevent accidental releases of regulated substances. 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 Chevron Products Company, Phillips 66 Company, Shell Martinez Refinery, and Tesoro Refining and Marketing Company).

The primary regulatory programs of this type are based on requirements in the amendments to the 1990 Clean Air Act as follows: (1) the Process Safety Management (PSM) program, which focuses on protecting workers, and 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 is administered by EPA. Bay Area refineries are subject to Cal/OSHA's PSM program, which is very similar to the federal OSHA program focusing on worker safety, 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 EPA's RMP program to limit exposure of the public, 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 ISOs are very similar to CalARP requirements, but with certain more stringent local provisions.

5. Air District Rules Affecting Refineries

The following is a partial list of the air pollution rules and regulations that the Air District implements and enforces at Bay Area refineries:

- Regulation 1: General Provisions and Definitions
- Regulation 2, Rule 1: Permits, General Requirements
- Regulation 2, Rule 2: New Source Review
- Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants
- Regulation 2, Rule 6: Major Facility Review (Title V)
- Regulation 6, Rule 1: Particulate Matter, General Requirements
- Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units;
- Regulation 8, Rule 1: Organic Compounds, General Provisions
- Regulation 8, Rule 2: Organic Compounds, Miscellaneous Operations
- Regulation 8, Rule 5: Storage of Organic Liquids
- Regulation 8, Rule 6: Terminals and Bulk Plants
- Regulation 8, Rule 8: Wastewater (Oil-Water) Separators
- Regulation 8, Rule 9: Vacuum Producing Systems
- Regulation 8, Rule 10: Process Vessel Depressurization
- Regulation 8, Rule 18: Equipment Leaks
- Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Regulation 8, Rule 33: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- Regulation 8, Rule 44: Marine Vessel Loading Terminals
- Regulation 9, Rule 1: Sulfur Dioxide
- Regulation 9, Rule 2: Hydrogen Sulfide
- Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines
- Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines
- Regulation 9, Rule 10: Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries
- Regulation 11, Rule 10: Cooling Towers
- Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries
- Regulation 12, Rule 12: Flares at Petroleum Refineries
- 40 CFR Part 60, Subpart J: Standards of Performance for Petroleum Refineries

(NSPS)

- 40 CFR Part 61, Subpart FF: Benzene Waste Operations (NESHAP)
- 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)
- State Airborne Toxic Control Measure for Stationary Compression Ignition (Diesel) Engines (ATCM)

III. NEED FOR REGULATORY ACTION

Refineries are among the largest single sources of criteria pollutants, precursors to the formation of criteria pollutants and climate pollutants in the Bay Area. Further, the five Bay Area refineries rank among the top ten facilities in the Bay Area for risk-weighted emissions of TACs, based on an evaluation of emissions from stationary sources in 2012 and using risk factors for cancer and chronic hazard index. Bay Area refineries are also some of the largest individual sources of NO_x and SO₂ in the region. Bay Area refineries are also the largest industrial sources of greenhouse gas emissions. While historically, refinery emissions have tended to decrease overall over time; there are occasions when some emissions have increased despite the regulatory environment in which they operate. Some of the factors that can result in increased refinery emissions include higher production rates to meet increased demand or to compensate for loss of production in other regions, upset conditions and accidents, and changes in crude oil or product slates.

Table 2 includes the most recent criteria pollutant emissions data for the five affected refineries and five affected support facilities.

Table 2: Baseline Emissions from the Refineries and Associated Facilities

Facility Name	Average Annual Emissions (tons/year)				
	PM (filterable)	PM (cond.) ¹	TOG	NO _x	SO ₂
Chevron	173	255	2,187	910	339
Phillips 66	53	—	337	266	409
Shell	409	98	1,749	971	1,084
Tesoro	80	91	1,200	763	572
Valero	123	—	494	1,205	111
Chemtrade West	4	—	55	3	127
Eco Services	18	—	1	13	362
Air Products	10	—	9	3	2
Phillips 66 (Carbon Plant)	29	—	0	239	1,242
Air Liquide	16	—	29	2	2
Total Emissions	915	444	6,061	4,375	4,250

Given the significance of these facilities, it is important to have a wholistic and accurate understanding of their impact on the environment and surrounding communities. The improved emissions inventories required by the proposed Rule 12-15 will help accomplish this goal. These improved inventories would cover a broader set of sources

¹ Condensable PM emissions are estimated based on a very small number of non-standard tests on FCCUs. These numbers will change as more testing is completed at the refineries.

than have been traditionally reported and would ensure that consistent and state-of-the-art methods are used to estimate emissions.

Proposed Rule 12-15 would also require monitoring of emissions at the refinery fence-line. This monitoring is an important complement to the effort to improve emissions inventories because it will help “ground truth” the engineering estimates used in the emissions inventory, with the ultimate goal of ensuring that public health is protected.

In addition, proposed Rule 12-15 would require refineries to provide to the Air District crude slate and non-crude feedstock information. This will enable the Air District to determine whether there is a correlation between changes in crude slate and feedstock changes and increases in emissions. Determination of a correlation (or lack thereof) will help the Air District decide whether such changes should be addressed in future regulations. Apart from future rule development, any relationship between changes in feedstocks and increased emissions would also be relevant to implementation of the Air District’s current new source review program codified in Air District Regulation 2, Rule 1 and Rule 2. Under some circumstances, a change in process feed materials could be an “alteration” or “modification” as defined in Regulation 2, Rule 1, and thus require a permit.

A. Crude Slate and Emissions

As new sources of North American crude oil become available, the refining of these different crude oils may also lead to increased emissions. As mentioned above, heavy, sour crude from Canadian tar sands may increase GHG emissions due to the need for more intensive processing. The high sulfur content of crude oil from tar sands may also lead to higher SO₂ emissions and may potentially contain more toxic metals. Crude oil from shale has characteristics that may also lead to increases in other emissions. The crude from shale is lighter and, therefore, more easily converted to products, which may lead to lower GHG emissions. However, this crude has higher VOC and H₂S content, which may lead to increased emissions of these pollutants from storage and loading operations and from equipment leaks. Because of the potential for changes in the sources of crude oil, the Air District seeks to improve our understanding of the relationship between these changes and resulting changes in emissions. This section (III.A.) of the staff report discusses the theory underlying the relationship between crude oil composition and refinery air emissions.

For optimal performance, petroleum refineries are designed to process crude oil with a certain range of characteristics. A refinery may either directly purchase crude oil that has parameters within these ranges or purchase crude oils that do not and then blend these crude oils to create a blended crude oil that does. The crude oils and crude oil blends that a refinery may process is commonly referred to as a refinery’s “crude slate.”

Key crude oil parameters include:

- Crude oil fractions
- API Gravity (Density)
- Sulfur content
- Nitrogen content
- Vapor pressure
- Benzene, Toluene, Ethylene, and Xylene content
- Total Acid Number
- Metals content


These parameters are measured through tests on crude oil called "crude assays." Through the crude assay, refiners are able to determine the values of each of the parameters listed above.

Crude oil fractions

Crude oil is not a single substance but rather is a mixture of substances (hydrocarbons, water, metals, mineral salts, and sediments). Hydrocarbons are organic compounds composed of carbon and hydrogen atoms. Crude assays characterize petroleum fractions by boiling point ranges. Typical crude oil fraction boiling points are shown in Table 3.

**Table 3
Typical Boiling Point Ranges of Crude Oil Fractions**

Product	Boiling Point Range (° F)
Propane, Butanes, and Other Gases	< 85
Gasoline	85 – 185
Naphtha	185 – 350
Kerosene	350 – 450
Diesel	450 – 650
Gas Oil	650 – 1050
Residue (e.g. asphalt)	> 1050



The first step in crude oil refining (after cleaning the crude oil) is heating the crude oil to over 1000 °F to separate the crude oil fractions. Crude oils that have more diesel, gas oil, and residue fractions than gasoline, naphtha, and kerosene fractions require more heating and are, therefore, more energy intensive, resulting in more emissions of GHGs and other combustion products such as NOx and possibly SO₂.

API Gravity (Density)

Density is a ratio of how much something weighs relative to its volume (e.g., pounds per gallon). Because of the manner in which API gravities are determined, more dense ("heavier") crude oils will have lower API gravities while less dense ("lighter") crude oils will have higher API gravities as shown in Table 4.

**Table 4
Crude Oil Classification Based on API Gravity**

Category	API Gravity
Light Crudes	> 38
Medium Crudes	29 to 38
Heavy Crudes	8.5 to 29
Very Heavy Crudes	< 8.5

Lighter
↓
Heavier

Heavier crude oils will have greater amounts of heavier crude oil fractions. Because heavier crude oils and crude oil fractions are denser, they require more power to pump. Power at a refinery is typically supplied by refinery gas turbines. Therefore, an increase in required power directly increases the amount of emissions from gas turbines. Heavier crude oils also require more heating from refinery furnaces and process heaters, directly increasing emissions.

Sulfur Content

The total amount of sulfur (in all forms) is reported in crude assays as sulfur content in percentage by weight. Typically, crude oils with sulfur content greater than 0.5 percent by weight are called "sour" while crude oils with sulfur content less than 0.5 percent by weight are called "sweet." Sour crude oils require more treatment to remove the sulfur. This directly results in higher emissions from sulfur treatment plants.

Crude assays also include the concentration (in units of parts per million by weight) of a subset of sulfur compounds including H₂S and mercaptans. H₂S is considered a toxic air contaminant that has an odor similar to rotten eggs while mercaptans are organic compounds that have a particularly strong odor similar to rotting cabbages. Crude oils with more H₂S and mercaptans may result in more odors from storage tanks storing crude oil and recovered oil. Odors from such tanks have resulted in public nuisances in nearby communities.

Increased crude oil sulfur content will increase the:

- Amount of hydrogen needed in refinery hydrotreaters,
- Emissions from hydrogen plant furnaces and CO₂ vent,
- Sulfur content in refinery process gas,
- Sulfur content in refinery fuel gas,
- Emissions of SO₂, H₂S, and SAM from refinery fuel gas combustion, and
- Elemental sulfur produced and resulting number of trucks carrying sulfur offsite.

Nitrogen Content

Crude oils typically contain very low amounts of nitrogen compounds, but have a great significance in refinery operations. Nitrogen compounds can destroy or "poison" refinery

catalysts used in fluid catalytic crackers, hydrocrackers, and catalytic reformers. Poisoned catalyst will require more processing of the feedstock, which will increase emissions from those types of equipment.

Nitrogen compounds are also removed in refinery hydrotreaters; but are harder to remove than sulfur. Similar to sulfur, higher nitrogen content will require more hydrogen treatment resulting in more emissions from refinery hydrogen plant furnaces and vents. When treated with hydrogen, nitrogen compounds are transformed to ammonia (NH₃), a toxic air contaminant. Ammonia may then be carried over in refinery fuel gas and combusted at refinery equipment (boilers, furnaces, etc.) as well as be emitted in fluid catalytic crackers.

Vapor Pressure

Vapor pressure is an indication of a liquid's evaporation rate. Materials with higher vapor pressure are more volatile. For crude oils and crude oil products, vapor pressure is reported as Reid Vapor Pressure (RVP), which is the vapor pressure determined in a volume of air four times the liquid volume at 100 °F. Crude oils with higher RVP will evaporate more easily, leading to more emissions from storage tanks and as fugitive equipment leaks in refinery components (valves, pumps, flanges, etc.).

Benzene, Toluene, Ethylbenzene, and Xylene

Benzene, toluene, ethylbenzene, and xylenes are collectively called "BTEX" and each is considered a toxic air contaminant. BTEX are VOCs and toxic air contaminants lead to the formation of criteria pollutants. Crude oils and petroleum feedstocks with higher BTEX will result in increased BTEX and VOC emissions from storage tanks and fugitive equipment leaks from refinery equipment (valves, pumps, flanges, etc.).

Total Acid Number

Total acid number (TAN) is a measurement of the acidity of crude oil and is a measurement of potential corrosivity of a crude oil. Corrosive crude oils may result in deactivated catalysts, which will require more processing of materials to get the same amounts of product and will increase emissions. Corrosive crude oils may also result in the corrosion of crude unit internal components, piping and process vessels. Corrosion in crude unit components will reduce the efficiency of the crude unit and require more processing of the crude oil to get the same amount of products. More processing will require more heat from crude unit furnaces, directly increasing emissions. Corrosion of piping and process vessels may lead to fugitive equipment leaks and unexpected fires, explosions, and large quantities of emissions.

Metals Content (Iron, Nickel, and Vanadium)

Metallic compounds exist in all crude oils. Metals cause operational problems by poisoning catalysts used for hydroprocessing and cracking. All metals are considered a pollutant (particulate matter and possibly a toxic air contaminant) when emitted.

Solids contamination of crude can lead to air emissions when these metals settle in the heavy fuel oil or in the petroleum coke produced by the refinery. Air emissions of these metals can occur when the fuel oil or petroleum coke is burned. The organic metals in heavy gas oils are also a concern when the organic metals deposit on the coke formed in the fluid catalytic cracking (FCC) unit. This coke is burned in the FCC regenerator and these metals deposit on the catalyst. A portion of this catalyst is emitted from the FCC as particulates containing these metal compounds. In addition, metals in the feedstock can result in the deactivation of the catalyst in a FCC, which results in increased coke formation, which in turn, results in increased emissions.

Iron, nickel, and vanadium are especially problematic for a refinery. Iron can cause corrosive compounds such as iron oxide (rust) and iron sulfide. Also, high levels of iron may cause iron deposits in refinery pumps, resulting in more power to pump materials. Iron deposits in heat exchangers result in a decrease in the heat transfer efficiency, requiring more heat from boilers, furnaces, or process heaters directly increasing emissions from boilers, furnaces, or process heaters. Iron deposits in pumps, piping, and heat exchangers may also cause metal to corrode creating holes in the equipment and creating fugitive equipment leaks or cooling tower emission leaks.

Nickel can cause corrosion of crude distillation towers and gas turbines and catalytic poisoning. Nickel may be emitted when combusting refinery fuel gas. When directly emitted, nickel is considered a carcinogen and a toxic air contaminant.

For high temperature power generators (gas turbines), the presence of vanadium in refinery fuel gas may lead to ash deposits on the turbine blades, cause severe corrosion, and ultimately may cause a refinery power plant to fail. An unexpected shutdown of a refinery power plant leads to refinery imbalances in fuel gas, steam, and power resulting in unplanned flaring and flared emissions.

Vanadium in refinery fuel gas may also cause the deterioration of refractory furnace linings. A deteriorated refractory lining will result in less heat transfer in a boiler, furnace or process heater. To get the same amount of heat from a boiler, furnace, or process heater with a deteriorated refractory lining; a refinery will have to increase the amount of fuel burned, which directly increases emissions from the boiler, furnace, or process heater.

Refinery Configuration

As previously mentioned, refineries are designed and operated ("configured") to process crude oil and petroleum feedstocks within certain ranges of: API gravity, sulfur content, nitrogen content, TAN, and metals content. If crude oil and/or petroleum feedstocks with parameters outside of these ranges are processed, "routine" emissions could increase and catastrophic failures may occur resulting in refinery fires or explosions and unexpected shutdowns of refinery process units and excessive flaring. Unexpected shutdowns of refinery equipment generate large amounts of emissions. A summary of

refinery emissions impact by crude oil parameter and refinery equipment is listed in Table 5.

**Table 5
Summary of Refinery Emissions Impact by Crude Oil Parameter**

Parameter	Parameter Impact	
	Pollutants	Refinery Equipment/Activity
API Gravity	<ul style="list-style-type: none"> • NO_x • CO • SO₂ • VOC • PM₁₀/PM_{2.5} • GHGs • Toxics 	<ul style="list-style-type: none"> • Crude Unit furnaces • Fluid Catalytic Cracking Unit (FCCU) • Delayed Coker • Fluid Coker • Flexicoker • Solvent Deasphalting Unit • Process unit furnaces
Sulfur Content Total Reduced Sulfur	<ul style="list-style-type: none"> • SO₂ • H₂S • Odors 	<ul style="list-style-type: none"> • Sulfur Recovery Units (SRUs) • Fuel gas combustion (furnaces, boilers, turbines, etc.) • Flares • Wastewater treatment • Storage tanks
Nitrogen Content	<ul style="list-style-type: none"> • NH₃ (a toxic) • NO_x 	<ul style="list-style-type: none"> • FCCU • Fuel gas combustion • Hydrocrackers
Vapor Pressure	<ul style="list-style-type: none"> • VOC • GHGs • Toxics 	<ul style="list-style-type: none"> • Storage tanks • Fugitive equipment leaks • Loading operations • Pressure relief devices • Process vessels
BTEX	<ul style="list-style-type: none"> • Benzene • Toluene • Ethylene • Xylene 	<ul style="list-style-type: none"> • Storage tanks • Fugitive equipment leaks • Fuel gas combustion (furnaces, boilers, turbines, etc.)
Total Acid Number	<ul style="list-style-type: none"> • NO_x • CO • SO₂ • VOC • PM₁₀/PM_{2.5} • GHGs • Toxics 	<ul style="list-style-type: none"> • Heat Exchangers • Cooling Towers • Process upsets • Flares • FCCU • Delayed Coker • Fluid Coker • Flexicoker • Solvent Deasphalting Unit
Metals Content	<ul style="list-style-type: none"> • NO_x • CO • SO₂ • VOC • PM₁₀/PM_{2.5} • GHGs • Toxics 	<ul style="list-style-type: none"> • FCCU • Flares • Fuel gas combustion (furnaces, boilers, turbines, etc.) • Delayed Coker • Fluid Coker • Flexicoker • Gas Turbine • Hydrocracker • Solvent Deasphalting Unit

IV. PROPOSED RULE REQUIREMENTS

Proposed Rule 12-15 is included in Appendix A of this report. The air monitoring guidance document is included in Appendix B. Explanations of the various provisions of proposed Rule 12-15 are provided below.

A. Administrative Procedures

Proposed Rule 12-15 would require refinery owners/operators to submit to the Air District emission inventories and air monitoring plans, subject to review by members of the public and other interested stakeholders. For air monitoring plans, comments received would be considered by Air District staff before taking final action to approve, require revisions, or disapprove the plans. Comments on emission inventories would be considered by Air District staff with no time limit, which is consistent with inventories being "living documents" that may change as best practices evolve. Emission inventories and air monitoring plans would be posted on the Air District's website.

The administrative procedures by which the Air District would review and take final action to approve or disapprove the inventories and plans are specified in Sections 12-15-402 and 404 of proposed Rule 12-15.

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). The definition of "trade secrets" provided in Section 6254.7 of the California Government Code follows:

"Trade secrets," as used in this section, may include, but are not limited to, any formula, plan, pattern, process, tool, mechanism, compound, procedure, production data, or compilation of information which is not patented, which is known only to certain individuals within a commercial concern who are using it to fabricate, produce, or compound an article of trade or a service having commercial value and which gives its user an opportunity to obtain a business advantage over competitors who do not know or use it.

Section 12-15-407 of proposed Rule 12-15 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 "trade secret" redacted. These provisions are intended to facilitate processing of trade secret information by expediting release of related public information while helping ensure that trade secret portions are not inadvertently released. The purpose of Section 407 is purely administrative. Actual trade secret protections derive from the Government Code. The Air District's Administrative Code sets forth procedures for how the Air District will handle trade secret information that is responsive to Public Records Act requests.

B. Pollutant Coverage

Proposed Rule 12-15 would cover the three primary categories of regulated air pollutants: (1) criteria pollutants (and their precursors), (2) toxic pollutants, i.e., toxic air contaminants (TACs), and (3) climate pollutants, e.g., greenhouse gases. These terms are defined in the proposed rule.

The definition of TAC refers to the California State TAC list and includes those state-identified TACs that have a basis for the evaluation of health effects under guideline procedures adopted by OEHHA for the Air Toxics "Hot Spots" Program.

The Air District realizes the importance of reducing climate pollutants and staff has developed the *Regional Climate Protection Strategy, 10-Point Climate Action Work Program* and created a new department, the Climate Protection Section, to investigate and implement ways to reduce climate pollutants. Proposed Rule 12-15 requires that emissions inventories for climate pollutants be developed and submitted to the Air District. This information will help the Air District begin to address climate change issues. Air District staff will assess emissions of climate pollutants and the refineries' abilities to make feasible improvements in their operations to reduce climate pollutants. While the Statewide AB32 Cap-and-Trade system represents a major effort towards control of climate pollutants, the Air District intends to explore ways to further reduce these pollutants in a manner that complements, and does not conflict with, the Cap-and-Trade system.

C. Source Coverage

Proposed Rule 12-15 would apply to 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 the Air District has a need to understand emissions from these mobile sources, in order to have a complete understanding of refinery emissions as sources of crude oil change. Thus emissions from these regulated operations are included in the requirements of the rule. This concept is addressed in the definition of "Emissions Inventory". Several other definitions in the proposed rule are intended to clarify source coverage.

Proposed Rule 12-15 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. The definition of "Support Facility" in the proposed rule identifies these independently-controlled facilities that are subject to the rule.

D. 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 the proposed rule.

Because of 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 Air District has decided not to include detailed emissions inventory methodologies in the rule itself. Doing so would make the rule language extremely cumbersome, and would necessitate frequent rule amendments as the state of the art progresses. As reflected in Section 12-15-405 of proposed Rule 12-15, the Air District staff will continue to publish, and periodically update, emissions inventory guidelines for petroleum refineries that set the most accurate available methodologies to be used for emissions inventories required by proposed Rule 12-15. Inventories submitted by refineries will be evaluated on a case-by-case basis. Any inconsistencies between the submitted inventories and Air District guidance will be judged based upon whether the refinery has provided an adequate justification for methodologies used.

The Air District previously published a refinery emissions inventory guidelines document ("*Refinery Emissions Inventory Guidelines: An Assessment of EPA Document Emission Estimation Protocol for Petroleum Refineries*") in 2013, and expects to publish updated guidelines prior to the public hearing for adoption of proposed Rule 12-15.

The Emissions Inventory described in proposed Rule 12-15 serves the same purpose as the "permit renewal questionnaire" that is currently sent to each refinery (and every other permitted facility) on an annual basis. This questionnaire is required to be completed by the refinery as a condition of permit renewal, and is the basis for the refinery's estimated emissions. The new Emissions Inventory will eventually replace the "permit renewal questionnaire," with possible duplication of these two documents necessary for 2016 calendar year data. The new Emissions Inventory, like the current "permit renewal questionnaire," is a necessary element of the Air District's permitting program (required by EPA) and also necessary for the Air District to meet its obligation to provide emissions data to CARB. The authority for both the current "permit renewal questionnaire" and the new Emissions Inventory is Healthy & Safety Code Sections 41511 and 42303.

E. Emissions Inventories and Crude Slate Report

1. Emissions Inventories Report

The establishment of annual emissions inventories would provide a basis for determining emissions variations that occur at each refinery from year to year.

Each refinery would be required to prepare and submit an annual refinery emissions inventory report. The public would be given an opportunity to provide input regarding emissions inventory reports, as described in Section 12-15-402 of proposed Rule 12-15.

2. Crude Slate Report

Each refinery, but not support facilities, would be required to provide information on the crude oil volume and composition, or "crude slate," processed at its crude units as described above, as well as the volume and composition of pre-processed feedstock processed at other process units. The combined information would be included in a "crude slate report." As explained below, the Air District would use this information to determine if significant crude slate changes lead to increased emissions.

The crude oil and pre-processed feedstock parameters required for the crude slate report are:

- Total volume (thousands of barrels)
- API gravity as it relates to higher crude density (degrees)
- Sulfur content (percentage by weight)
- Vapor pressure (psia)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) contents
- Selected metals (iron, nickel and vanadium) content as an indicator of potential heavy metals that may be released when coke is burned in the fluid catalytic cracking unit

The refinery operators must collect monthly values of each of these parameters and provide this information to the Air District.

Parameters such as nitrogen content, acid content, and total reduced sulfur may be required in future updates of this rule if the Air District deems that data to be necessary to determine the relationship between crude slate and emission rates.

The Authority for this requirement is Health & Safety Code Sections 41511 and 42303. Section 42303 gives the Air District broad authority to require the submittal of information that "will disclose the nature, extent, quantity, or degree of air contaminants which are, or may be, discharged" by a source. Section 41511 expressly allows this authority to be exercised through rulemaking, and gives the Air District authority to adopt rules requiring sources of air pollution to take actions deemed reasonable to determine the amount of air emissions.

These statutory authorities do not limit the Air District's authority to requesting only information about actual emissions. As explained above, crude slate composition can affect air emissions in a myriad of ways. Tracking changes in crude slate is thus reasonably calculated to "disclose the nature, extent, quantity, or degree of air contaminants."

The Air District acknowledges that there is uncertainty regarding the relationship between crude slate changes and refinery air emissions. Refinery representatives have contended throughout the development of this rule either that there is no relationship, or that any such relationship is obscured by intermediary variables. While the Air District does not entirely discount these arguments, the refineries' position is by no means self-evident. As explained above, it is apparent that the potential for changes in crude slate to affect air emissions is significant. The crude slate requirements of proposed Rule 12-15 establish a process to determine whether and to what extent air emissions vary according to changes in crude slate and other feedstocks.

The crude slate requirements of proposed Rule 12-15 will not be burdensome for the refineries. These requirements use information already in refineries' possession, without the need for additional testing or other procedures. The information is being required in a form that does not reveal data that a refinery might reasonable deem "trade secret."

In balancing the degree of uncertainty regarding the relationship of crude and feedstock changes to refinery air emissions, the high potential for an impact upon the breathing public if the relationship is positive, and the minimal burden on the refineries associated with complying with the provisions of this rule, the Air District believes it has struck an appropriate balance and that the crude slate report requirements of proposed Rule 12-15 are "reasonable" within the meaning of Health & Safety Code Section 41511.

F. Air Monitoring

Proposed Rule 12-15 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. The term "fence-line monitoring system" is defined in the proposed rule. The Air District will publish guidelines describing the factors it will use in evaluating air monitoring plans (see Sections 12-15-406).

Monitoring plans submitted by refineries will be evaluated on a case-by-case basis. Any inconsistencies between plans and Air District guidance will be evaluated based upon whether the refinery has adequately explained why the plan meets the requirements of proposed Rule 12-15 notwithstanding the inconsistency with the guidance. The same standard of review will be applied to plan updates.

An air monitoring guideline document was developed concurrently with Rule 12-15. Much of the information gathering for the guideline document was 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 was gathered from academia, industry, the community, and other government agencies to discuss and weigh the various options and the expert panel provided input to guide the Air District in developing the air monitoring guidelines.

Under proposed Rule 12-15, 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. The systems would be installed, operated, and maintained, in accordance with the approved plan (see Section 12-15-501 of proposed Rule 12-15).

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. Updated guidelines would be subject to Air District Board approval. 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.

The fence-line monitoring required by proposed Rule 12-15 is an important element in the effort to improve understanding of refinery emissions. Data in emissions inventories is based to a large extent on emissions factors, which can be described very broadly as multipliers applied to throughput data to yield estimates of actual emissions. Fence-line monitors, by contrast, measure actual emissions. While fence-line monitoring alone is not sufficient to assess total emissions from a refinery, it can provide vitally important reference points to help "ground truth" emissions inventories.

The Authority for this requirement is Health & Safety Code Sections 41511 and 42303.

V. ECONOMIC IMPACTS

The California Health and Safety Code generally requires two different economic analyses for proposed regulations by an air district. The first (H&S Code §40728.5) is a socioeconomic analysis of the adverse impacts of compliance with the proposed regulation on affected industries and business. The second analysis (H&S Code §40920.6) is an incremental cost effectiveness analysis when multiple compliance approaches have been identified by an air district. Table 6 in Section V.A of this report lists the estimated costs of compliance with each element of proposed Rule 12-15 that has a significant cost. Section V.B of this report discusses the required socioeconomic analysis that is based on the costs in Section V.A. Section V.C of this report discusses the incremental cost analysis, which is not applicable to this proposed rule because they do not require specific emission controls.

A. Cost of Compliance

Table 6 - Regulation 12, Rule 15 Costs		
Section	Requirement	Cost (per refinery)
12-15-401	Prepare Annual Petroleum Refinery Emissions Inventory (beginning with year 2016 data)	\$90,000 annual cost (annualized)
12-15-408.2	Prepare Monthly Crude Slate Report (beginning with year 2017 data)	
12-15-408.1	Prepare Historical Monthly Crude Slate Reports for 2013, 2014, 2015 and 2016	
12-15-403	Prepare Air Monitoring Plans (one time submittal)	\$250,000 (one-time)
12-15-501	Fence-line Air Monitoring System (construction and operation)	\$2,000,000 one-time capital cost (\$280,000 / year annualized basis) PLUS \$50,000 annual maintenance & operation cost

B. Socioeconomic Analysis

Section 40728.5 of the California Health and Safety Code requires an air district to assess the socioeconomic impacts of the adoption, amendment or repeal of a rule if the rule is one that "will significantly affect air quality or emissions limitations." Applied Development Economics of Walnut Creek, California has prepared a socioeconomic analysis of proposed Rule 12-15. This analysis is based on the costs of compliance with the proposed rule discussed in Section V.A, and is attached to this report as Appendix C. The analysis concludes that the socio-economic impacts of compliance with the requirements of these rules is less than significant.

C. Incremental Cost Effectiveness

Section 40920.6 of the California Health and § Code requires an air district to perform an incremental cost analysis for any proposed Best Available Retrofit Control Technology (BARCT) rule or for a rule that is part of an Alternative Emission Reduction Strategy as described in Section 40914 of the Health and Safety Code. This analysis is omitted here because the proposed rule does not include either of these elements.

VI. REGULATORY IMPACTS

Section 40727.2 of the California Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and air district air pollution control requirements for the equipment or source type affected by a proposed change in air district rules. The air district must then note any differences between these existing requirements and the requirements imposed by the proposed change. Appendix D of this report identifies the federal and air district control requirements that affect the sources potentially impacted by proposed Rule 12-15.

VII. ENVIRONMENTAL IMPACTS

Pursuant to the California Environmental Quality Act, the Air District has had an initial study for the proposed rule prepared by Environmental Audit, Inc. of Placentia, California. The initial study concludes that there are no potential significant adverse environmental impacts associated with the proposed rule. A negative declaration will be proposed for adoption by the Air District Board of Directors and is included as Appendix E of this report. The initial study and negative declaration were circulated for public comment prior to the public hearing for this rule.

VIII. AIR DISTRICT COST RECOVERY

The administrative procedures in proposed Rule 12-15 (described in Section IV.A of this report) represent a significant workload increase for the Air District. Although most of these procedures are one-time events and processes, they cannot be completed on the required schedule with existing staff.

The Air District has the authority to assess fees to regulated entities for the purpose of recovering the reasonable costs of implementing and enforcing applicable regulatory requirements. On March 7, 2012, the Air District's Board of Directors adopted a Cost Recovery Policy that specifies that newly adopted regulatory measures should include fees that are designed to recover increased regulatory program activity costs associated with the measure (unless the Board of Directors determines that a portion of those costs should be covered by tax revenue).

In accordance with the adopted Cost Recovery Policy, Air District staff is developing new fee schedules to be included in Regulation 3, Fees, through a separate rule development process.

IX. RULE DEVELOPMENT AND PUBLIC CONSULTATION PROCESS

Since July 2012, Air District staff has engaged in an extensive and comprehensive rule development process involving a wide range of stakeholders that has resulted in this proposed rule, Emissions Inventory Guidelines, Air Monitoring Guidelines, and staff report.

In October of 2012, a *Work Plan for Action Items Related to Accidental Releases from Industrial Facilities* was adopted by the Board of Directors that included development of a Petroleum Refinery Emissions Tracking Rule. In March of 2013 a workshop report and initial draft rule were issued and the rule development process began.

The following meetings and efforts to work with the interested public and affected industry then took place:

- Apr. 2013: Public workshops held (Martinez, Richmond, District office via webcast).
- May 2013: Stationary Source Committee briefing.
- Jul. 2013: Desert Research Institute (DRI) report on air monitoring finalized documenting air monitoring options and methodologies that might be utilized to measure air quality impacts in communities near refineries.
- Jul. 2013: Panel of national air monitoring experts convened that expanded on the air monitoring options and methodological information contained in the DRI report via webcast.
- Sep. 2013: Draft refinery emissions inventory guidelines issued.
- Sep. 2013: Stakeholder Technical Work Group meeting.
- Jan. 2014: Revised draft rule and preliminary responses to comments issued.
- Jan. 2014: Stakeholder Technical Work Group meeting.
- Feb. 2014: Stationary Source Committee briefing.
- May 2013–Apr. 2014: Additional meetings with stakeholders held.
- Apr. 2014: Stationary Source Committee briefing.
- Jun. 2014: Amended draft Rule 12-15 posted on the Air District website.
- Aug. 2014: Air monitoring guidance draft released and comments accepted.
- Aug.–Oct. 2014: Continued meetings with stakeholders.
- Jan. 2015: Comment period opened.
- Mar. 2015: Public workshops held (Martinez, Richmond, Benicia, Air District Office via webcast).
- Sep. 2015: Comments addressed; interim staff report and revised draft rules released.
Three open houses for four refinery emission reduction rules

- Jan. 2016: (Martinez, Richmond, Benicia). Draft Rule 12-15, staff report, and associated documents posted for public review.
- Mar. 2016 Amended draft Rule 12-15 posted for public review.

A number of substantive changes were made to the January 2016 version of draft Rule 12-15 in response to comments from stakeholders. This is why a draft rule was re-posted in March 2016. A summary of the changes and the reasoning behind them is listed below:

Community Air Monitoring

Several commenters expressed concerns about the refinery operators being responsible for siting and operating community air monitors. The Air District has decided to take the responsibility for siting and operating these monitors. The monitoring stations will be funded with a broad-based fee through the pending update to Regulation 3: Fees. This approach will offer the same level of information to the Air District and the public, while addressing concerns raised by both the refineries and community groups.

Crude Slate Reporting

The definitions and administrative requirements for crude slate reporting have been clarified and the data requirements have changed. The purpose of these changes is to focus on the data elements most relevant to emissions: volume, API gravity, sulfur content, vapor pressure, BTEX² content and certain metals. Other changes were made to address refinery operator concerns about confidential business information and to clarify how the data is to be summarized for use by the Air District.

Emissions Inventory

The process for public participation in the emissions inventory development has been modified to ensure that Air District-approved inventories are made available to the public as quickly as possible. The public will have the opportunity to review the emissions inventories and provide comments to the Air District after they are posted. The Air District will correct deficiencies identified to ensure a more accurate and complete emissions inventory.

In addition, refinery operators will not be responsible for providing data on the emissions of support facilities. Those facilities will provide emissions inventory data directly to the Air District.

² BTEX is an acronym for benzene, toluene, ethylbenzene and xylene. These are toxic organic compounds found in some crude oils.

Energy Utilization

The requirement to submit energy utilization reports has been removed. The Air District is continuing to evaluate various approaches for addressing greenhouse gas emissions from refineries. Some of these approaches require this information and some do not. If needed, this information will be required in future rulemaking actions.

The Air District received several comments on draft Rule 12-15. A full response to comments will be included in the package that is presented at the Board Hearing.

X. CONCLUSION

Pursuant to Section 40727 of the California Health and Safety Code, the proposed new rule must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference. Proposed new Regulation 12, Rule 15 is:

- Necessary to ensure the maintenance of the NAAQS and ensure protection of the public from toxic air contaminants given the size and impact of the refineries and the possibility of changes to the properties of crude oil processed at these refineries;
- Authorized under Sections 40000, 40001, 40702, 40725 through 40728, and 44391 of the California Health and Safety Code;
- Written or displayed so that their meaning can be easily understood by the persons directly affected by them;
- Consistent with other Air District rules, and not in conflict with state or federal law;
- Non-duplicative of other statutes, rules or regulations. To the extent duplication exists, such duplication is appropriate for execution of powers and duties granted to, and imposed upon, the Air District; and
- Implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 40000, 40702, and 44391.

The proposed new rule has met all legal noticing requirements, has been discussed with the regulated community, and reflects consideration of the input and comments of many affected and interested parties. Air District staff recommends adoption of proposed new Regulation 12, Rule 15.

Appendices:

Appendix A: Proposed Regulation 12, Rule 15

Appendix B: Air Monitoring Guidelines for Petroleum Refineries

Appendix C: Socio-Economic Analysis

Appendix D: Regulatory Impacts Analysis

Appendix E: CEQA Initial Study / Negative Declaration

ACKNOWLEDGEMENTS

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December 10, 2015

**SOCIO-ECONOMIC ANALYSIS:
PROPOSED AMENDMENTS TO REGULATION 8, RULE
18 ("EQUIPMENT LEAKS"), REGULATION 11, RULE
10 ("HEXALENT CHROMIUM EMISSIONS AND TOTAL
HYDROCARBON EMISSIONS FROM PETROLEUM
REFINERY COOLING TOWERS"), and DRAFT NEW
REGULATION 6, RULE 5 ("PARTICULATE
EMISSIONS FROM REFINERY FLUIDIZED
CATALYTIC CRACKING UNITS")**

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INTRODUCTION

The Bay Area Air Quality Management District (“BAAQMD” or the “Air District”) seeks to amend two existing rules to reduce emissions from oil refineries operating in the Bay Area. In addition, the Air District seeks to adopt a new rule with the same effect in mind. The proposed new rule is Draft Regulation 6 Rule 5 (“Particulate Emissions from Refinery Fluidized Catalytic Cracking Units [FCCUs]”). BAAQMD seeks to amend and rename existing Regulation 11 Rule 10 (“Hexavalent Chromium and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers”), the purpose of which is to achieve technically feasible and cost-effective total hydrocarbon (THC) and hazardous air pollutants emission reductions from cooling towers at Bay Area refineries by requiring more rapid detection of heat exchanger leaks. BAAQMD also proposes to amend Regulation 8 Rule 18 (“Equipment Leaks”). After this introduction, this report discusses in greater detail the various rule changes the Air District proposes with regard to Draft Rule 6-5, Rule 8-18, and Rule 11-10 (Section Two). After that discussion, the report describes the socioeconomic impact analysis methodology and data sources (Section Three). The report describes population and economic trends in the nine-county San Francisco Bay Area (Section Four), which serves as a backdrop against which the Air District is contemplating the three sets of rule changes. Finally, the socioeconomic impacts stemming from the proposed rule changes are discussed in Section Five.

The report is prepared pursuant to Section 40728.5 of the California Health and Safety Code, which requires an assessment of socioeconomic impacts of proposed air quality rules. The findings in this report can assist Air District staff in understanding the socioeconomic impacts of the proposed requirements, and can assist staff in preparing a refined version of the rule. Figure 1 is a map of the nine-county region that comprises the San Francisco Bay Area Air Basin.

Figure 1 – Map of San Francisco Bay Area Region



BACKGROUND TO PROPOSED AMENDMENTS TO EXISTING RULE 11-10 AND RULE 8-18, AND PROPOSED NEW RULE 6-5

This part of the report summarizes key changes to existing rules Rule 8-18 and Rule 11-10. In addition, proposed new Rule 6-5 is summarized below.

SUMMARY OF PROPOSED AMENDMENTS TO REGULATION 8, RULE 18

Oil refineries, chemical plants, bulk plants, bulk terminals, and other facilities that store, transport, and use volatile organic liquids lose some organic material as fugitive emissions wherever there is a connection between two pieces of equipment. Valves, pumps, and compressors also leak organic material. Rule 8-18 requires such facilities to maintain a leak detection and repair (LDAR) program. The purpose of the LDAR program is to ensure that all equipment is inspected regularly and, if a leak is found to exceed the leak threshold, the equipment must be repaired, replaced, or placed on a list of non-repairable equipment. Currently, equipment in heavy liquid service is only subject to the applicable leak standards in Section 8-18-300, and not to the LDAR requirements in Section 8-18-400. Without routine inspections of equipment in heavy liquid service, leaks may not be found and repaired. In an effort to strengthen existing rules, the Air District is considering the following changes to Regulation 8, Rule 18, which would:

- Become effective January 1, 2018:
 - Include identification and monitoring of heavy liquid service equipment, and
 - Subject heavy liquid service equipment to leak minimization and repair requirements;
- Amend the non-repairable equipment standard to reduce the allowable amount of equipment placed on non-repairable list;
- Identify the cause of any background reading greater than 50 ppmv;
- Require mass emission monitoring for all equipment placed on the non-repairable equipment list; and
- Add a maximum leak concentration and/or mass emissions limit for fugitive equipment subject to the rule.

In addition, administrative changes to rule language will be made to improve clarification and enforceability of the rule.

SUMMARY OF PROPOSED AMENDMENTS TO REGULATION 11, RULE 10

The Bay Area has five large-scale petroleum refineries which operate a total of 32 cooling towers. These cooling towers are large, industrial heat exchangers that are used to dissipate significant heat loads to the atmosphere from process equipment that contains organic compounds, through the evaporation of cooling water. When a heat exchanger leaks, organic compounds can pass from the process equipment into the cooling water. If a leak is not detected and repaired, significant quantities of organic compounds can be released into the atmosphere when the cooling water is exposed to the atmosphere in the cooling tower.

District Regulation 11, Rule 10 was developed in 1989 to reduce hexavalent chromium emissions from cooling towers. The goal of the proposed amendments to Regulation 11, Rule 10 is to achieve technically feasible and cost-effective total hydrocarbon (THC) and hazardous air pollutants emission reductions from cooling towers at Bay Area refineries by requiring more rapid detection of heat exchanger leaks. A concept paper issued by the Air District underscored the importance of rapid detection: "Emissions resulting from leaks can become significant if heat exchanger leaks go undetected for long periods of time. In 2010 a heat exchanger leak at a Bay Area refinery resulted in emissions of at least 52 tons of VOC over a recorded period of a few weeks. The total magnitude of emissions from the leak event was greater; emissions from the event were only estimated once the leak was detected, which was likely weeks if not months after the leak began."¹

SUMMARY OF DRAFT NEW REGULATION 6, RULE 5

Fluidized catalytic cracking units (FCCUs) are complex processing units at refineries that convert heavy components of crude oil into lighter compounds used in the production of gasoline and other transportation fuels. The FCCU uses a fine catalyst powder to promote the cracking reaction. During this reaction, the catalyst becomes coated with petroleum coke, which is burned off in the regenerator portion of the FCCU so that the catalyst can be reused. The regenerator vessel exhaust contains particulate matter (PM), sulfur dioxide (SO₂), ammonia, carbon monoxide (CO), oxides of nitrogen (NO_x), and volatile organic compounds (VOC).

The goal of this rulemaking is to achieve technically feasible and cost-effective emission reductions of PM less than 2.5 microns in diameter (PM_{2.5}) and PM_{2.5} precursors (compounds that form PM_{2.5} by chemical reactions in the atmosphere after being emitted from a given source) from FCCUs at Bay Area refineries. The Air District plans to achieve emission reductions with two actions, as described in the "Workshop Report for the Refinery Emissions Reduction Strategy." The first action, addressed in this report, will propose a new regulation that will address ammonia emissions (a PM_{2.5} precursor) at those FCCUs that use ammonia or urea injection. The second, future action will amend Regulation 6,

¹ BAAQMD, "Appendix C: Concept Paper for Changes to Rule 11-10: Colling Towers", page C:2 (2015)

Rule 5, to further address emissions of $PM_{2.5}$ and $PM_{2.5}$ precursors. The specific elements of this second action will depend in part on the results of the first action.

Of the five petroleum refineries operating in the Bay Area, four — Chevron, Shell, Tesoro, and Valero — operate FCCUs. The Valero refinery recently retrofitted its FCCU with a wet scrubber which has significantly reduced the emissions from this FCCU. Valero will be exempt from the proposed ammonia emission limit. The Chevron and Tesoro FCCUs use ammonia to promote the control of filterable particulate matter emissions in electrostatic precipitators (ESPs), which results in unreacted ammonia being emitted to the atmosphere (“ammonia slip”). The Shell FCCU uses ammonia or urea injection to control NO_x generation and also to promote ESP operation, which results in unreacted ammonia being emitted to the atmosphere.

METHODOLOGY

Applied Development Economics (ADE) began this analysis by preparing a statistical description of the industry groups of which the affected sources are a part, analyzing data on the number of establishments, jobs, and payroll. We also estimated sales generated by impacted industries, as well as net profits for each affected industry.

This report relies heavily on the most current data available from a variety of sources, particularly the State of California's Employment Development Department (EDD) Labor Market Information Division. In addition, this report relies on data from the US Census County Business Patterns, as well as from the US Internal Revenue Service.

With the above information, ADE was able to estimate net after tax profit ratios for sources affected by the proposed rule. ADE calculated ratios of profit per dollar of revenue for affected industries. The result of the socioeconomic analysis shows what proportion of profits the compliance costs represent. Based on assumed thresholds of significance, ADE discusses in the report whether the affected sources are likely to reduce jobs as a means of recouping the cost of rule compliance or as a result of reducing business operations. To the extent that such job losses appear likely, the indirect multiplier effects of the jobs losses are estimated using a regional IMPLAN input-output model. In some instances, particularly where consumers are the ultimately end-users of goods and services provided by the affected sources, we also analyzed whether costs could be passed to households in the region.

When analyzing the socioeconomic impacts of proposed new rules and amendments, ADE attempts to work closely within the parameters of accepted methodologies discussed in a 1995 California Air Resources Board (ARB) report called "Development of a Methodology to Assess the Economic Impact Required by SB513/AB969" (by Peter Berck, PhD, UC Berkeley Department of Agricultural and Resources Economics, Contract No. 93-314, August, 1995). The author of this report reviewed a methodology to assess the impact that California Environmental Protection Agency proposed regulations would have on the ability of California businesses to compete. The ARB has incorporated the methodologies described in this report in its own assessment of socioeconomic impacts of rules generated by the ARB. One methodology relates to determining a level above or below which a rule and its associated costs is deemed to have significant impacts. When analyzing the degree to which its rules are significant or insignificant, the ARB employs a threshold of significance that ADE follows. Berck reviewed the threshold in his analysis and wrote, "The Air Resources Board's (ARB) use of a 10 percent change in [Return on Equity] ROE (i.e. a change in ROE from 10 percent to a ROE of 9 percent) as a threshold for a finding of no significant, adverse impact on either competitiveness or jobs seems reasonable or even conservative."

REGIONAL DEMOGRAPHIC AND ECONOMIC TRENDS

This section of the report tracks the larger economic and demographic contexts within which the Air District is contemplating amendments and new rules that will affect five refineries in the Bay Area. This section begins with a broad overview of demographic and economic trends, with discussion then narrowing to industries and sources affected by the proposed rule changes.

REGIONAL DEMOGRAPHIC TRENDS

Table 1 tracks population growth in the nine-county San Francisco Bay Area between 2004 and 2014, including data for the year 2009. Between 2004 and 2009, the region grew by approximately 1 percent a year. Between 2009 and 2014, the region grew annually at a much slower rate of 0.1 percent per year. Overall, there are 7,510,942 people in the region. At 1,889,638, Santa Clara County has the most people, while Napa has the least, at 140,362.

Table 1: Regional Demographic Trends: 2004-2014: Population Growth: San Francisco Bay Area

AREAS	2004	2009	2014	04-09 CAGR	09-14 CAGR	04-14 CAGR
California	36,810,358	38,648,090	38,714,725	1.0%	0.03%	0.5%
SF Bay Area	7,096,575	7,459,858	7,510,942	1.0%	0.1%	0.6%
Alameda County	1,507,500	1,574,857	1,594,569	0.9%	0.2%	0.6%
Contra Costa County	1,020,898	1,073,055	1,102,871	1.0%	0.5%	0.8%
Marin County	252,485	260,651	258,972	0.6%	-0.1%	0.3%
Napa County	133,294	138,917	140,362	0.8%	0.2%	0.5%
San Francisco County	799,263	856,095	845,602	1.4%	-0.2%	0.6%
San Mateo County	723,453	754,285	753,123	0.8%	-0.03%	0.4%
Santa Clara County	1,759,585	1,880,876	1,889,638	1.3%	0.1%	0.7%
Solano County	421,657	427,837	429,552	0.3%	0.1%	0.2%
Sonoma County	478,440	493,285	496,253	0.6%	0.1%	0.4%

Source: Applied Development Economics, based on California Department of Finance Population Estimates E-5 Reports (2005, 2010, and 2015)(Note: CAGR = Compound Annual Growth Rate)

REGIONAL ECONOMIC TRENDS

Data in Table 2 describe the larger economic context within which officials are contemplating amendments to Regulations 11-10, 8-18, and new Rule 6-5. Businesses in the region employ over three million workers, or 3,525,910. The number of private and public sector jobs in the region grew annually by 1.8 percent between 2009 and 2014, after having increased somewhat slightly between 2004 and 2009 by 0.2 percent a year. Of the 3,525,910 workers, 429,768, or 12.2 percent, are in the public sector, meaning 87.8 percent of all employment is in the private sector. Economic sectors in the table below are sorted by the share of total employment. The top-five sectors in the Bay Area are Health and Social Assistance (NAICS 62) (427,982 workers), Professional/Technical Services (NAICS 54) (399,834 workers), Retail (NAICS 44-45) (335,791), Manufacturing (NAICS 31-33) (318,909) and Public Sector except Education. Of the top-ten leading sectors in terms of employment, five exhibited

high rates of annual growth from 2009 to 2015, growing annually by more than four percent. These sectors are Health and Social Assistance, Professional/Technical Services, Eating and Drinking Places, Administrative Support (NAICS 561), and Information (NAICS 51). Combined, these five sectors employ 41 percent of total employment, or 1,444,160 out of 3,525,910. In the state, only Healthcare and Social Assistance and Administrative Support grew annually by faster than four percent, and, relative to the Bay Area, employment in these five sectors at the state level represent a lesser share of total employment, i.e. 37 percent, or 5,865,991 out of 15,809,083. In other words, the leading sectors in the Bay Area perform better than comparable sectors in the state as a whole. Moreover, of the top-ten leading sectors in the Bay Area, only one (Public Sector except Education) had less workers in 2014 than in 2009, underscoring the resilience of the regional economy in the aftermath of the Great Recession. By way of comparison, of the top ten leading sectors in the state, three (Manufacturing, Public Sector excluding Education, and Public Sector Education) still have not recovered from the Great Recession, exhibiting less workers now than in 2009.

Table 2: San Francisco Bay Area Employment Trends By Sector and Select Industries: 2004 - 2014

SECTORS	BAY AREA							CALIFORNIA						
	2004	2009	2014	DISTRI BUTION . 2014	RANK	04-09 CAGR	09-14 CAGR	2004	2009	2014	DISTRI BUTION 2014	RANK	04-09 CAGR	09-14 CAGR
Private & Public	3,191,93	3,225,98	3,525,91	100.0%		0.2%	1.8%	17,218,905	16,970,214	15,809,083	100.0%		-0.3%	-1.4%
Private Sector	2,750,09	2,784,16	3,096,14	87.8%		0.2%	2.1%	14,875,824	14,546,383	13,501,711	85.4%		-0.4%	-1.5%
Public Sector	441,843	441,817	429,768	12.2%		0.0%	-0.6%	2,343,081	2,423,831	2,307,372	14.6%		0.7%	-1.0%
62 Health, Social Assist	281,219	311,429	427,982	12.1%	1	2.1%	6.6%	1,284,158	1,435,436	2,000,372	12.7%	1	2.3%	6.9%
54 Professional, Tech.	277,827	321,808	399,834	11.3%	2	3.0%	4.4%	911,684	1,012,533	1,171,165	7.4%	6	2.1%	3.0%
44-45 Retail	332,742	309,241	335,791	9.5%	3	-1.5%	1.7%	1,613,395	1,513,767	1,623,371	10.3%	2	-1.3%	1.4%
31-33 Manufacturing	353,215	314,263	318,909	9.0%	4	-2.3%	0.3%	1,517,533	1,275,752	1,264,114	8.0%	4	-3.4%	-0.2%
Public Sector exc. Educ	293,586	301,289	285,923	8.1%	5	0.5%	-1.0%	1,279,867	1,331,656	1,280,253	8.1%	3	0.8%	-0.8%
722 Eating, Drinking Pl	209,204	225,123	280,016	7.9%	6	1.5%	4.5%	996,086	1,053,084	1,260,661	8.0%	5	1.1%	3.7%
561 Admin. & Support	170,698	154,174	188,502	5.3%	7	-2.0%	4.1%	899,139	798,632	976,801	6.2%	8	-2.3%	4.1%
23 Construction	182,894	142,030	160,702	4.6%	8	-4.9%	2.5%	845,747	618,068	669,766	4.2%	10	-6.1%	1.6%
51 Information	114,908	111,333	147,826	4.2%	9	-0.6%	5.8%	482,608	438,640	456,992	2.9%	13	-1.9%	0.8%
Public Sector Education	148,257	140,528	143,845	4.1%	10	-1.1%	0.5%	1,063,214	1,092,175	1,027,119	6.5%	7	0.5%	-1.2%
42 Wholesale	121,948	115,992	123,664	3.5%	11	-1.0%	1.3%	650,334	645,959	709,154	4.5%	9	-0.1%	1.9%
81 Other Services	140,657	157,003	120,053	3.4%	12	2.2%	-5.2%	666,102	740,659	504,176	3.2%	12	2.1%	-7.4%
52 Finance & Insurance	147,378	128,158	119,297	3.4%	13	-2.8%	-1.4%	619,396	539,753	515,504	3.3%	11	-2.7%	-0.9%
611 Private Education	63,445	76,295	91,463	2.6%	14	3.8%	3.7%	232,470	279,124	317,066	2.0%	16	3.7%	2.6%
55 Mgt of Companies	63,228	59,185	73,268	2.1%	15	-1.3%	4.4%	233,847	197,752	225,792	1.4%	19	-3.3%	2.7%
48-49 Trnsprt\Warhsng	53,541	49,753	68,367	1.9%	16	-1.5%	6.6%	409,583	399,259	446,430	2.8%	14	-0.5%	2.3%
71 Entertainment & Rec	49,505	50,679	59,064	1.7%	17	0.5%	3.1%	236,527	243,203	276,312	1.7%	17	0.6%	2.6%
53 Real Estate, Leasing	60,592	53,776	56,598	1.6%	18	-2.4%	1.0%	276,460	254,863	264,129	1.7%	18	-1.6%	0.7%
721 Accommodations	45,832	45,556	48,669	1.4%	19	-0.1%	1.3%	197,036	197,496	211,139	1.3%	20	0.0%	1.3%
99 Misc	48,243	45,602	43,443	1.2%	20	-1.1%	-1.0%	53,008	64,639	60,738	0.4%	21	4.0%	-1.2%
11 Agriculture	16,005	18,502	14,754	0.4%	21	2.9%	-4.4%	369,951	373,603	415,444	2.6%	15	0.2%	2.1%
562 Waste Managemnt	10,340	10,796	11,606	0.3%	22	0.9%	1.5%	37,679	40,330	46,329	0.3%	23	1.4%	2.8%
22 Utilities	4,710	6,423	4,758	0.1%	23	6.4%	-5.8%	55,960	59,705	57,627	0.4%	22	1.3%	-0.7%
21 Mining	1,961	876	1,576	0.0%	24	-15%	12.5%	21,239	23,865	28,629	0.2%	24	2.4%	3.7%

Source: Applied Development Economics, based on California EDD LMID QCEW 2004, 2009, and 2014 (note: CAGR = Compound Annual Growth Rate)

Of the top ten leading sectors in the Bay Area, four can be categorized as knowledge-based industries that tend to exhibit average higher-pay and have more educated and skilled workforce. These industries (Health and Social Assistance, Professional\Technical Services, Manufacturing, and Information) employ 1,294,551 workers, or 37 percent of total public and private sector workers. Of the top-ten sectors in the state, three are knowledge-based industries (Health and Social Assistance, Manufacturing, and Professional\Technical Services), but their combined workforce represents 28 percent of total employment in the state.

TRENDS FOR INDUSTRIES SUBJECT TO PROPOSED RULE-MAKING

The proposed rule changes affect one particular industry in the Bay Area, namely petroleum refineries. While the California EDD LMID reports that there are 23 refineries in the nine-county region, more than likely, this state agency applied a broader definition for refinery operations in the region. Appendix A identifies a number of “refineries” included in the EDD LMID’s database; as this shows, many are not full scale refineries but rather are engaged in a variety of petroleum-related operations. In any event, the proposed new rules will affect five refineries operating in the Bay Area.

Table 3 below identifies the businesses in the Bay Area that are full-scale refineries. The list comes from the CEC, which also included each refinery’s throughput capacity. Of the five operating refineries in the region, Chevron is the largest, with the capacity to refine 245,271 42-gallon barrels of crude oil per day. At 78,400, Phillips 66 has the lowest throughput capacity. The five affected sources employ 5,513 workers, who make, on average, \$173,700 ².

Table 3 – Bay Area Refineries (California Energy Commission) and Crude Oil Capacity

Refinery	Barrels Per Day
Chevron U.S.A. Inc., Richmond Refinery	245,271
Tesoro Refining & Marketing Company, Golden Eagle (Avon/Rodeo) Refinery	166,000
Shell Oil Products US, Martinez Refinery	156,400
Valero Benicia Refinery	132,000
Phillips 66, Rodeo Refinery	78,400

Source: Applied Development Economics, Inc., based on California Energy Commission

²The 5,513 estimate is based on California EDD LMID and US Census County Business Patterns.

SOCIOECONOMIC IMPACT ANALYSIS

This section of the report analyzes socioeconomic impacts stemming from changes to existing Rule 11-10 and Rule 8-18, as well as impacts stemming from new Draft Rule 6-5. The discussion begins first with a summary of costs associated with each rule. Then, we present our findings with regard to estimated revenues and profits generated by the five affected sources, comparing the combined costs of all three rules against estimated net profits, in an effort to determine if these rules significantly impact the affected industry.

COST OF COMPLIANCE

Below we separately summarize costs associated with the three rule changes.

AMENDMENTS TO EXISTING RULE 11-10

The rule provides three options to perform the new, required hydrocarbon leak monitoring. The first two options are specified (daily manual sampling and analysis; use of a continuous, automated sampler), and the third option is alternative monitoring specified by the refinery and approved by the Air District. Costs are considered only for the two specified options, which may be performed in three ways:

- 1) Daily, manual sampling and analysis by contract personnel using off-site laboratory facilities. This option entails no capital costs, but has high contractor costs. Twenty-eight cooling towers require daily sampling (\$500 for 1st sample at a refinery, \$150 for every other cooling tower at the same refinery). Two towers require only weekly sampling because of their low flowrates (\$150 for each weekly sample). Two towers require no manual sampling because they are equipped with continuous automated samplers.
- 2) Daily, manual sampling and analysis by refinery personnel using on-site laboratory facilities. This option entails both capital costs for sampling and analytic equipment and labor costs for staff. Each of the five Bay Area refineries would purchase sampling-analysis systems consisting of an FID analyzer, stripping column and GC analyzer for \$25,000. Each refinery would need two complete systems, except for the refinery with the most (13) cooling towers, which would require three complete systems, for a total of 11 complete systems. Each refinery would need two staffers for each system at a cost of \$100,000 per year.
- 3) Continuous, automated sampling. This option entails high capital costs for analyzers and auxiliary equipment such as a shelter. 30 new continuous analyzers would be required (2 cooling towers already have these devices) at an average, installed cost of \$300,000 each. The two existing analyzers are assumed to each require \$75,000 upgrades). Labor costs associated with maintaining these samplers are assumed to be \$25,000 per year for refineries with up to 5 cooling towers, and an additional \$25,000 for refineries with more than 5 cooling towers.

With the specified assumptions, the most costly option, which is the basis for the cost impact analysis, is daily manual sampling and analysis by contract personnel with the following annual costs, and no capital costs:

Chevron:	\$519,000
Phillips 66:	\$402,000
Shell:	\$245,000
Tesoro:	\$840,000
Valero:	\$183,000
Total:	\$2,190,000

AMENDMENTS TO EXISTING RULE 8-18

District staff has estimated that implementing requirements to Rule 8-18 as amended will result in \$6.8 million in total annual costs for the five affected sources. Of the \$6.8 million, \$250,000 is an annualized amount over 10 years for capital improvements. The balance (\$6,550,000) is an annual recurring cost for checking 78,160 valves, 2,930 pumps and 158 pressure relief devices.

DRAFT NEW RULE 6-5

BAAQMD staff believes that, for the Phase 1 part of Rule 6-5 (i.e. the ammonia emission limit), affected refineries, rather than simply reducing ammonia and/or urea injection to reduce ammonia slip emissions to no more than the proposed limit, will instead elect to optimize ammonia and/or urea injection to minimize overall fine particulate emissions, as allowed in the proposed rule. Although optimization will entail sampling and analysis, it will not require permanent sampling equipment or other capital equipment or permanent administrative costs. Monitoring of ammonia emissions will be required, so the costs of compliance are based on the installation and operation of a continuous emission monitoring system (CEMS) at the three non-exempt refineries that operate an FCCU, as described in the staff report.

SOCIOECONOMIC IMPACT ANALYSIS

The five affected sources' combined throughput capacity is approximately 674,582 42-gallon barrels per day, which takes into consideration periods when refineries may be off-line. While the affected sources refine 674,582 barrels of crude oil per day, they generate an estimated 693,044 gallons of refined products a day. Assuming a 87 percent utilization rate, and further estimating the price of refined product at \$120 per barrel , we estimate the affected refineries in total generate \$30.3 billion in revenues a year, from which is generated \$2.1 billion in after-tax net profits. When comparing these figures with the combined annual costs (annual recurring operational costs and annualized capital costs) stemming from Rule 11-10, Rule 8-18, and Draft Rule 6-5 rule changes, we obtain cost-to-net profit ratios of less than one percent (Table 4). For example, with regard to changes to Rule 11-10, in aggregate, affected sources will bear one of three costs. Should all five affected sources pursue Rule 11-10 Option 1 ("daily water sampling"), these sources will be \$3.7 million in annual costs. Combining the annual costs of all three rule changes (Rule 11-10 option 1, Rule 8-18, and Draft New Rule 6-5) results in a total cost of \$10,523,000, which, when compared against aggregate net profits, amounts to 0.51 percent cost-to-net profit ratio, which is below the 10 percent threshold used for purposes of determining when impacts are significant. As indicated in the table below starting at Row 25, the cost-to-net profit ratios in all cases are below the ten percent threshold. As a result, the combined impacts stemming from Rule 11-10, Rule 8-18, and Draft Rule 6-5 are less than significant. Moreover, because affected sources are not small businesses, small businesses are not disproportionately impacted by the proposed rule changes.

Table 4 — Socioeconomic Impact Analysis: Proposed Amendments to Regulation 11 Rule 10, Regulation 8-18, and New Draft Rule 6-5

SECTION	ROW	DATA ATTRIBUTES	ALL REFINERIES	CHEVRON	TESORO	SHELL	VALERO	PHILLIPS 66
Industry Profile	1	Effective Barrels Per Day	674,582	212,648	143,921	135,598	114,443	67,972
	2	Est. Revenues	\$30.3 billion	\$9.6 billion	\$6.5 billion	\$6.1 billion	\$5.1 billion	\$3.1 billion
	3	Est. Net Profits	\$2.1 billion	\$653 million	\$442 million	\$416 million	\$351 million	\$208 million
		Number of Cooling Towers	32	8	13	3	1	7
Cost of Compliance Profile For Each of the Three Rules	4	Regulation 11 Rule 10 compliance costs						
	5	Annual Recurring Cost (daily water sampling and analysis by contractors)	\$2,190,000	\$519,000	\$840,000	\$245,000	\$183,000	\$402,000
	6	Regulation 6 Rule 5 compliance costs						
	7	Annualized Capital Cost (CEMs for ammonia emission monitoring)	\$279,000	\$93,000	\$93,000	\$93,000	\$0	\$0
	8	Regulation 8 Rule 18 compliance costs						
	9	Annualized Capital Cost (data management systems)	\$250,000	\$110,000	\$30,000	\$40,000	\$50,000	\$20,000
	10	Annual Recurring Cost (additional component inspection)	\$6,550,000	\$2,490,000	\$1,370,000	\$860,000	\$1,150,000	\$680,000
	11							
	12							
	13							
Summary of Total Compliance Cost	18	Total Costs for 3 Rules In First 10 Years (annualized capital + annual recurring)	\$9,269,000	\$3,212,000	\$2,333,000	\$1,238,000	\$1,383,000	\$1,102,000
	19	Total Costs for 3 Rules After 10 Years (annual recurring costs only)	\$8,740,000	\$3,009,000	\$2,210,000	\$1,105,000	\$1,333,000	\$1,082,000
	20							
	21							
	22							
	23							
	24							
Socioeconomic Impact Analysis	26	Total Impact on Estimated Net Profits, all 3 Rules, In First 10 Years	0.44%	0.49%	0.53%	0.30%	0.39%	0.53%
	27	Total Impact on Estimated Net Profits, all 3 Rules, After 10 Years	0.42%	0.46%	0.50%	0.27%	0.38%	0.52%
	28							
	29							
	30							
	31							
	32							

Source: Applied Development Economics, based on BAAQMD, California Energy Commission, EIA, and US IRS SOI

APPENDIX A: LIST OF EDD LMID BAY AREA "REFINERIES"

COUNTY	NAME OF ESTABLISHMENTS	CITY	NUMBER OF WORKERS
Alameda	DASSEL'S PETROLEUM INC	FREMONT	1-4 employees
Alameda	RCA OIL RECOVERY	NEWARK	1-4 employees
Contra Costa	BAY AREA DIABLO PETROLEUM CO	CONCORD	1-4 employees
Contra Costa	CHEVRON CORP	RICHMOND	1-4 employees
Contra Costa	CHEVRON CORP	PACHECO	20-49 employees
Contra Costa	CHEVRON CORPORATION	SAN RAMON	5,000-9,999 employees
Contra Costa	PHILLIPS 66 RODEO REFINERY	RODEO	500-999 employees
Contra Costa	GENERAL PETROLEUM	RICHMOND	10-19 employees
Contra Costa	GOLDEN GATE PETROLEUM	RICHMOND	1-4 employees
Contra Costa	GOLDEN GATE PETROLEUM	RICHMOND	1-4 employees
Contra Costa	GOLDEN GATE PETROLEUM	CONCORD	1-4 employees
Contra Costa	NU STAR	MARTINEZ	20-49 employees
Contra Costa	PITCOCK PETROLEUM INC	PLEASANT HILL	10-19 employees
Contra Costa	SHELL MARTINEZ REFINERY	MARTINEZ	500-999 employees
Contra Costa	TESORO GOLDEN EAGLE REFINERY	PACHECO	500-999 employees
Contra Costa	UOP	DANVILLE	1-4 employees
Marin	GRAND PETROLEUM	SAN RAFAEL	1-4 employees
Marin	GREENLINE INDUSTRIES LLC	LARKSPUR	20-49 employees
San Francisco	DOUBLE AA CORP	SAN FRANCISCO	1-4 employees
San Francisco	R B PETROLEUM SVC	SAN FRANCISCO	5-9 employees
San Francisco	SEAYU ENTERPRISES INC	SAN FRANCISCO	5-9 employees
San Mateo	DOUBLE AA CORP	SOUTH SAN FRANCISCO	5-9 employees
San Mateo	SABEK INC	SOUTH SAN FRANCISCO	5-9 employees
San Mateo	SEAPORT REFINING & ENVRNMNTL	REDWOOD CITY	5-9 employees
Santa Clara	COAST OIL CO LLC	SAN JOSE	20-49 employees
Santa Clara	SHELL OIL PRODUCTS US	SAN JOSE	1-4 employees
Solano	BAY AREA DIABLO PETROLEUM CO	BENICIA	1-4 employees
Solano	CAT TECH INC	DIXON	1-4 employees
Solano	DANVILLE PETROLEUM	VALLEJO	5-9 employees
Solano	GOLDEN GATE PETROLEUM	BENICIA	1-4 employees
Solano	RUBICON OIL	BENICIA	1-4 employees
Solano	TIMEC CO INC	VALLEJO	20-49 employees
Solano	VALERO BENICIA REFINERY	BENICIA	250-499 employees
Solano	VALERO REFINING CO	BENICIA	1-4 employees
Solano	VALERO REFINING CO	BENICIA	1-4 employees
Sonoma	BAY AREA DIABLO PETROLEUM CO	CLOVERDALE	1-4 employees
Sonoma	ROYAL PETROLEUM CO INC	PETALUMA	5-9 employees

Source: ADE, Inc., based on California EDD LMID "Employers By Industry" Database

APPLIED DEVELOPMENT ECONOMICS, INC.

**SOCIO-ECONOMIC ANALYSIS OF PROPOSED
REGULATION 12, RULE 15: PETROLEUM
REFINING EMISSIONS TRACKING**

Prepared for:

**Bay Area Air Quality
Management District**

April 2016

Prepared by:



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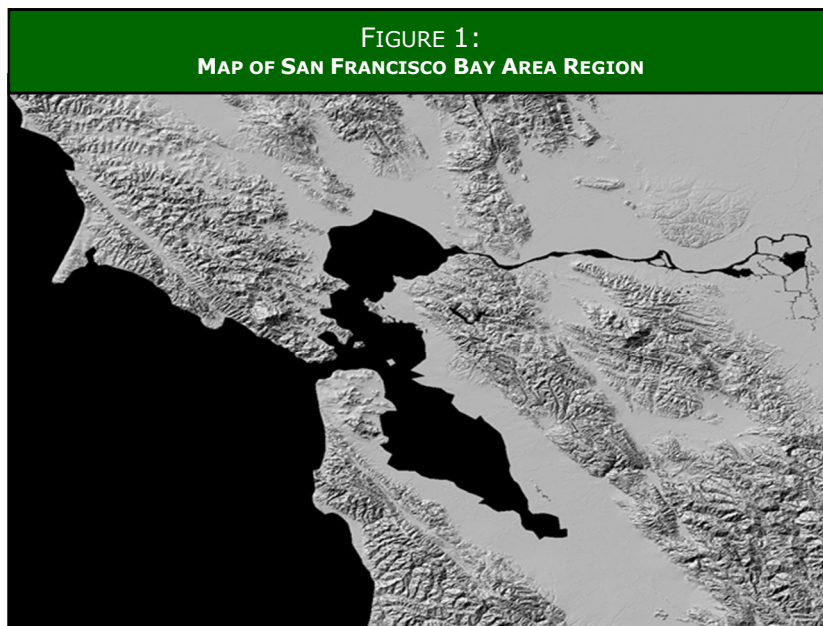
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1. INTRODUCTION

The Bay Area Air Quality Management District (“BAAQMD” or the “Air District”) seeks to adopt Regulation 12, Rule 15 (“Petroleum Refining Emissions Tracking” or “Regulation 12-15”). The purpose of Regulation 12-15 is to track air emissions and crude oil quality characteristics from petroleum refineries over time, and to establish monitoring systems to provide detailed air quality data along refinery boundaries. After this introduction, this report discusses in greater detail the elements of Regulation 12-15 with cost impacts to Bay Area refineries (Section Two). A complete discussion of all of the elements of this rule is included in the Final Staff Report. After the discussion of cost impacts, the report describes the socioeconomic impact analysis methodology and data sources (Section Three). The report describes population and economic trends in the nine-county San Francisco Bay Area (Section Four), which serves as a backdrop against which the Air District is contemplating adopting Regulation 12-15. Finally, the socioeconomic impacts stemming from the proposed regulation are discussed in Section Five.

The report is prepared pursuant to Section 40728.5 of the California Health and Safety Code, which requires an assessment of socioeconomic impacts of proposed air quality rules. The findings in this report can assist Air District staff in understanding the socioeconomic impacts of the proposed requirements, and can assist staff in preparing a refined version of the rule. Figure 1 is a map of the nine-county region that comprises the San Francisco Bay Area Air Basin.



2. BACKGROUND OF BAAQMD'S RULE 12-15

In general, the Air District regulates stationary sources of air pollution, which includes certain petroleum refineries that would be subject to proposed Regulation 12, Rule 15 ("Regulation 12-15"). Bay Area refineries are currently subject to over 20 separate air quality rules, many of which focus on specific equipment in place at refineries, as well as different kinds of pollutants emitted by refineries.

In an effort to further improve air quality, the Air District seeks to adopt Regulation 12, Rule 15. The purpose of Regulation 12-15 is to track air emissions and crude oil quality characteristics from petroleum refineries over time, and to establish monitoring systems to provide detailed air quality data along refinery boundaries. The rule covers three classes of regulated air pollutants, including "criteria pollutants", "toxic air contaminants" (TACs), and greenhouse gases (GHGs).¹

The Air District proposed Regulation 12-15 because of the possibility of changes to "crude oil slates" at the five petroleum refineries in the Bay Area, which could result in increases in emissions of criteria pollutants, TACs and GHGs. Crude oil slate refers to the characteristics of crude oil and other feedstocks processed at a refinery, including some composition elements and some physical characteristic elements.

Proposed Regulation 12, Rule 15 includes the following steps that will result in costs to the affected petroleum refineries:

- Submit consistent, **enhanced periodic emissions inventory information**, including information about cargo carriers;
- Make available **historic and periodic crude slate information, including volumes and composition data**, for imported pre-processed feedstocks as well as for crude oil;
- Install and operate new **air monitoring facilities at refinery fence lines**; and

The analysis of the socioeconomic impacts of new Regulation 12-15 in Section Five is based on the costs in Table 1. The basis for these costs is provided after the table.

¹Criteria pollutants are air pollutants for which there are ambient air quality standards that set levels of concentrations of pollutants designed to be protective of public health. Examples of criteria pollutants include ozone and particulate matter in the air. TACs refer to up to 200 air pollutant compounds that may have health impacts in terms of exposure though there are not yet any air quality standards. GHG refers to air pollutant compounds that affect global warming and climate change.

Table 1 - Regulation 12, Rule 15 Costs		
Section	Requirement	Cost (per refinery)
12-15-401	Prepare and Submit Annual Petroleum Refinery Emissions Inventory (beginning with year 2016 data)	\$90,000 / year (annualized)
12-15-408.2	Prepare Monthly Crude Slate Report (beginning with year 2016 data)	
12-15-408.1	Prepare Historical Monthly Crude Slate Reports for 2012, 2013, 2014 & 2015	
12-15-403	Prepare Air Monitoring Plans (one time submittal)	\$250,000 (one-time)
12-15-501	Fenceline Air Monitoring System (construction and operation)	\$2,000,000 (one-time construction) \$50,000 / year (maintenance & operation)

12-15-401 and 408

These sections require one-time submittals, or one-time document preparations, related to the refinery inventory and crude slate, as well as ongoing reports (monthly crude slate reports and annual inventories) are assumed to constitute one-half of a full-time employee (FTE) with a resulting annualized cost of \$90,000 at each of the refineries.

12-15-403

The one-time fenceline monitoring plans are expected to be prepared by an environmental consulting firm at a cost of no more than \$250,000 at each of the refineries. Air District staff is familiar with the required elements of this type of document and the resources required to complete them.

12-15-501

The Air Monitoring Guidelines prepared as a companion document to Rule 12-15 suggest that 2 permanent fenceline monitors (upwind and downwind of the refinery) will be required. District staff estimates that monitors will cost up to \$1,000,000 each to install. Therefore, total capital cost, including site development, infrastructure development (electricity and communications) and construction is not expected to exceed \$2,000,000 per refinery. Assuming \$25,000 per year for maintenance and operation at each monitor, and 2 monitors per refinery, the total annual cost is not expected to exceed \$50,000 per year per refinery. Air District staff have designed, constructed and operated similar monitoring facilities and are familiar with these costs.

All costs are summarized in Table 6 of Section 5, with costs shown above as occurring one-time converted to annualized costs by applying a capital recovery factor of 0.14 to the one-time cost, as discussed in Table 6.

3. METHODOLOGY

Applied Development Economics (ADE) began this analysis by preparing a statistical description of the industry groups of which the affected sources are a part, analyzing data on the number of establishments, jobs, and payroll. We also estimated sales generated by impacted industries, as well as net profits for each affected industry.

This report relies heavily on the most current data available from a variety of sources, particularly the State of California's Employment Development Department (EDD) Labor Market Information Division. In addition, this report relies on data from the State of California's Energy Commission (CEC), particularly with respect to measuring throughput capacity of the five refineries subject to these new requirements. From the CEC, we also obtained information on retail and wholesale prices of gasoline and other refinery products, as well as industry-specific profitability ratios.

With the above information, ADE was able to estimate net after tax profit ratios for sources affected by the proposed new regulation. ADE calculated ratios of profit per dollar of revenue for affected industries. The result of the socioeconomic analysis shows what proportion of profits the compliance costs represent. Based on assumed thresholds of significance, ADE discusses in the report whether the affected sources are likely to reduce jobs as a means of recouping the cost of compliance or as a result of reducing business operations. To the extent that such job losses appear likely, the indirect multiplier effects of the jobs losses are estimated using a regional IMPLAN input-output model. In some instances, particularly where consumers are the ultimately end-users of goods and services provided by the affected sources, we also analyzed whether costs could be passed to households in the region.

When analyzing the socioeconomic impacts of proposed new rules and amendments, ADE attempts to work closely within the parameters of accepted methodologies discussed in a 1995 California Air Resources Board (ARB) report called "Development of a Methodology to Assess the Economic Impact Required by SB513/AB969" (by Peter Berck, PhD, UC Berkeley Department of Agricultural and Resources Economics, Contract No. 93-314, August, 1995). The author of this report reviewed a methodology to assess the impact that California Environmental Protection Agency proposed regulations would have on the ability of California businesses to compete. The ARB has incorporated the methodologies described in this report in its own assessment of socioeconomic impacts of rules generated by the ARB. One methodology relates to determining a level above or below which a rule and its associated costs is deemed to have significant impacts. When analyzing the degree to which its rules are significant or insignificant, the ARB employs a threshold of significance that ADE follows. Berck reviewed the threshold in his analysis and wrote, "The Air Resources Board's (ARB) use of a 10 percent change in [Return on Equity] ROE (i.e. a change in ROE from 10 percent to a ROE of 9 percent) as a threshold for a finding of no significant, adverse impact on either competitiveness or jobs seems reasonable or even conservative."

4. REGIONAL DEMOGRAPHIC AND ECONOMIC TRENDS

This section of the report tracks economic and demographic contexts within which the Air District is contemplating new Regulation 12-15. Table 2 tracks population growth in the nine-county San Francisco Bay Area between 2003 and 2013, including data for the year 2008. Between 2003 and 2008, the region grew by approximately 1 percent a year. Between 2008 and 2013, the region grew annually at a much slower rate of 0.1 percent per year. Overall, there are 7,420,453 people in the region. At 1,868,558, Santa Clara County has the most people, while Napa has the least, at 139,255.

**TABLE 2:
REGIONAL DEMOGRAPHIC TRENDS: 2003-2013
POPULATION GROWTH: SAN FRANCISCO BAY AREA**

	Population			Annual Percent Change		
	2003	2008	2013	03 - 08	08 - 13	03 - 13
California	36,199,342	38,292,687	38,340,074	1.1%	0.0%	0.6%
Bay Area	7,025,575	7,375,678	7,420,453	1.0%	0.1%	0.5%
Alameda County	1,495,162	1,556,657	1,573,254	0.8%	0.2%	0.5%
Contra Costa County	1,005,590	1,060,435	1,087,008	1.1%	0.5%	0.8%
Marin County	250,793	258,618	255,846	0.6%	-0.2%	0.2%
Napa County	131,228	137,571	139,255	0.9%	0.2%	0.6%
San Francisco County	795,042	845,559	836,620	1.2%	-0.2%	0.5%
San Mateo County	717,921	745,858	745,193	0.8%	0.0%	0.4%
Santa Clara County	1,739,939	1,857,621	1,868,558	1.3%	0.1%	0.7%
Solano County	416,379	426,729	424,233	0.5%	-0.1%	0.2%
Sonoma County	473,521	486,630	490,486	0.5%	0.2%	0.4%

Source: Applied Development Economics, based on total population estimates from The California Department of Finance (E-5 Report)

Data in Table 3 describe the larger economic context within which officials are contemplating new Regulation 12-15. Businesses in the region employ over three million workers, or 3,376,819. The number of private and public sector jobs in the region grew annually by 0.5 percent between 2008 and 2013, after having grown somewhat slightly also between 2003 and 2008 by 0.8 percent a year. Of the 3,376,819 workers, 422,634, or 12.5 percent, are in the public sector, meaning 87.5 percent of all employment is in the private sector. In the state, almost 15 percent of all jobs are in the public sector, with 85 percent in the private sector. Relative to the state as a whole, manufacturing, professional/technical services, and education/health service sectors comprise a greater proportion of the regional employment base. In the region, these sectors comprise 9 percent (manufacturing), 11 percent (professional/technical services), and 15 percent (private education/health services) respectively of total employment. In the state, these sectors comprise 8 percent (manufacturing), 7

percent (professional/technical services), and 14.6 percent (private education/health services) of the statewide job base. In other words, as a percent of total workforce, the region employs more people in sectors with occupations that presumptively require more skills and are higher-paying. Conversely, typically lower-paying sectors such as agriculture and retail represent a higher share of the overall statewide employment base relative to the Bay Area. In the state, 2.7 percent of all jobs are in agriculture, whereas in the region, the figure is 0.4 percent. Almost 10.5 percent of all jobs in the state are in retail, while in the region, 9.8 percent of all jobs are in retail.

**TABLE 3
SAN FRANCISCO BAY AREA EMPLOYMENT TRENDS BY SECTOR: 2003-2013**

	Private and Public Sector Employment Trends			Employment Distribution		Ann. Percentage Chg: Bay Area	
	2003	2008	2013	Bay Area '13	State '13	03-08	08-13
Private and Public Sectors	3,158,570	3,285,661	3,376,819			0.8%	0.5%
Private Sector Only	2,713,025	2,837,090	2,954,185	87.5%	85.2%	0.9%	0.8%
11 Agriculture, Forestry, Fishing & Hunting	17,710	18,726	13,315	0.4%	2.7%	1.1%	-6.6%
21 Mining	1,744	982	1,876	0.1%	0.2%	-10.9%	13.8%
22 Utilities	4,639	5,497	5,591	0.2%	0.4%	3.5%	0.3%
23 Construction	177,987	178,171	151,847	4.5%	4.1%	0.0%	-3.1%
31-33 Manufacturing	361,948	343,551	308,961	9.1%	8.1%	-1.0%	-2.1%
42 Wholesale Trade	123,213	116,685	121,274	3.6%	4.5%	-1.1%	0.8%
44-45 Retail Trade	335,893	333,952	329,247	9.8%	10.4%	-0.1%	-0.3%
48-49 Transportation and Warehousing	51,995	54,050	68,846	2.0%	2.8%	0.8%	5.0%
51 Information	117,546	114,889	136,214	4.0%	2.9%	-0.5%	3.5%
52 Finance and Insurance	150,174	136,632	118,304	3.5%	3.4%	-1.9%	-2.8%
53 Real Estate and Rental and Leasing	61,693	58,089	55,222	1.6%	1.7%	-1.2%	-1.0%
54 Professional and Technical Services	277,412	344,560	378,755	11.2%	7.4%	4.4%	1.9%
55 Management of Companies and Enterprises	67,779	60,845	69,367	2.1%	1.4%	-2.1%	2.7%
56 Administrative and Waste Services	177,198	185,013	192,231	5.7%	6.4%	0.9%	0.8%
61 Educational Services	63,905	76,185	88,322	2.6%	2.0%	3.6%	3.0%
62 Health Care and Social Assistance	283,259	305,784	417,312	12.4%	12.6%	1.5%	6.4%
71 Arts, Entertainment, and Recreation	48,740	51,438	57,255	1.7%	1.7%	1.1%	2.2%
72 Accommodation and Food Services	252,693	283,578	314,978	9.3%	9.1%	2.3%	2.1%
81 Other Services, Ex. Public Admin	137,155	156,925	114,764	3.4%	3.1%	2.7%	-6.1%
99 UNCLASSIFIED ESTABLISHMENTS	342	11,538	10,504	0.3%	0.4%	102.1%	-1.9%
Public Sector Only (Federal, State and Local)	445,545	448,571	422,634	12.5%	14.8%	0.1%	-1.2%
Public Sector (excluding public educ.)	299,104	302,052	281,196	8.3%	8.2%	0.2%	-1.4%
6111 Public Education: Elementary and Secondary	112,275	105,053	104,467	3.1%	4.7%	-1.3%	-0.1%
6112 Public Education: Junior College	9,850	16,629	11,910	0.4%	0.6%	11.0%	-6.5%
6113 Public Education: Colleges and Universities	24,316	24,837	25,024	0.7%	1.2%	0.4%	0.2%
611z Public Education: Other			37	0.0%	0.0%		

Source: Applied Development Economics, based on California EDD LMID

Table 3 also shows the precipitous decline in employment in industries most-affected by the downturn in the economy that began in late 2007, namely housing. Construction employment declined by 3.1 percent per year between 2008 and 2013, with finance and insurance dropping by 2.8 percent per year, and real estate dropping by 1.0 percent. On a positive note, employment in health care increased annually by 6.4 percent annually between 2008 and 2013, and transportation-warehousing increased annually by five percent.

Proposed Regulation 12-15 affects one particular industry in the Bay Area, namely refineries. While the California EDD LMID reports that there are 23 refineries in the nine-county region, more than likely, this state agency applied a broader definition for refinery operations in the region. Appendix A identifies a number of “refineries” included in the EDD LMID’s database; as this shows, many are not full scale refineries but rather are engaged in a variety of petroleum-related operations. Nonetheless, Table 4 shows refinery trends *per* the EDD-LMID. What is striking about Table 4 is the high average pay workers garner in this industry.

TABLE 4: SF BAY AREA EDD-LMID REFINERY TRENDS, 1999-2009					
	2003	2008	2013	03-08 CAGR	08-13 CAGR
Establishments	35	23	23	-8.05%	0.00%
Employment	6,738	7,816	5,323	3.01%	-7.39%
Payroll	\$768,112,469	\$1,326,728,738	\$986,117,494	11.55%	-5.76%
Average Pay	\$114,006	\$169,756	\$185,250	8.29%	1.76%

Source: Applied Development Economics, Inc., based on California EDD LMID

Table 5 identifies the businesses in the Bay Area that are full-scale refineries. The list comes from the CEC, which also included each refinery’s throughput capacity. Of the five operating refineries in the region, Chevron is the largest, with the capacity to refine 245,271 42-gallon barrels of crude oil per day. At 78,400, Phillips 66 has the lowest throughput capacity.

TABLE 5 BAY AREA REFINERIES (CALIFORNIA ENERGY COMMISSION) AND CRUDE OIL CAPACITY	
Refinery	Barrels Per Day
Chevron U.S.A. Inc., Richmond Refinery	245,271
Tesoro Refining & Marketing Company, Golden Eagle (Avon/Rodeo) Refinery	166,000
Shell Oil Products US, Martinez Refinery	156,400
Valero Benicia Refinery	132,000
Phillips 66, Rodeo San Francisco Refinery	78,400

Source: Applied Development Economics, Inc., based on California Energy Commission

5. SOCIOECONOMIC IMPACT ANALYSIS

This section of the report analyzes socioeconomic impacts stemming from new Regulation 12-15. If the proposed new regulation is adopted, the District estimates that the five impacted refineries would each incur total annualized costs of \$455,000 for ten years, the period over which costs associated with capital equipment and one-time air monitoring plans would be amortized. After the amortization period, ongoing costs of \$140,000 per year per refinery would continue for additional inventories, reports and operation and maintenance of air monitoring systems.

The five affected sources' combined throughput capacity is approximately 674,582 42-gallon barrels per day, which takes into consideration periods when refineries may be off-line. While the affected sources refine 674,582 barrels of crude oil per day, they generate an estimated 693,044 gallons of refined products a day. Assuming a 87 percent utilization rate, and further estimating the price of refined product at \$120 per barrel², we estimate the affected refineries generate \$30.3 billion in revenues a year, from which is generated \$2.1 billion in after-tax net profits. When comparing these figures with the annualized costs stemming from the proposed new regulation, we obtain cost-to-net profit ratio ranging from 0.2 percent to 0.5 percent. **As a result, impacts are less than significant.** Moreover, because this establishment is not a small business, small businesses are not disproportionately impacted by the proposed regulation.

² \$119.80 per barrel of gasoline =
 $((436,600 * \$124.26)_{\text{GASOLINE}} + (124,748 * \$112.35)_{\text{JET FUEL}} + (131,748 * \$112.35)_{\text{KEROSENE, OTHERS}}) / (693,044)_{\text{TOTAT REFINED PRODUCTS}}$

TABLE 6
SOCIOECONOMIC IMPACT ANALYSIS: PROPOSED NEW REGULATION 12, RULE 15

	All Sources	Chevron	Tesoro	Shell	Valero	Phillips 66
Effective Barrels of Crude Per Day	674,582	212,648	143,921	135,598	114,443	67,972
Estimated Revenues	\$30.3 billion	\$9.6 billion	\$6.5 billion	\$6.1 billion	\$5.1 billion	\$3.1 billion
Estimated Net Profits	\$2.1 billion	\$653 million	\$442 million	\$416 million	\$351 million	\$208 million
Annual Costs for Regulation 12-15 with one-time costs annualized by applying a capital recovery factor (CRF) factor of 0.14. This CRF is derived using BAAQMD's cost-effectiveness methodology in the BACT-TBACT Workbook and assuming an interest rate of 6% and "project horizon" of 10 years.						
Reg 12-15-401, 408: Inventories and Crude Reports (Initial & Annual - annualized)	\$450,000	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000
Reg 12-15-403: Fenceline Air Monitoring Plans (annualized)	\$175,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Reg 12-15-501: Fenceline Monitoring Construction (annualized)	\$1,400,000	\$280,000	\$280,000	\$280,000	\$280,000	\$280,000
Reg 12-15-501: Air Monitoring Operation & Maintenance (Annual - annualized)	\$250,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Total Annualized Costs	\$2,275,000	\$455,000	\$455,000	\$455,000	\$455,000	\$455,000
Cost to Net Profits	0.11%	0.07%	0.10%	0.11%	0.13%	0.22%
Significant?	No, in all cases	No, in all cases	No, in all cases	No, in all cases	No, in all cases	No, in all cases

6. APPENDIX A: LIST OF EDD-LMID BAY AREA "REFINERIES"

County	Name of Establishments	City	Number of Workers
Alameda	DASSEL'S PETROLEUM INC	FREMONT	1-4 employees
Alameda	RCA OIL RECOVERY	NEWARK	1-4 employees
Contra Costa	BAY AREA DIABLO PETROLEUM CO	CONCORD	1-4 employees
Contra Costa	CHEVRON CORP	RICHMOND	1-4 employees
Contra Costa	CHEVRON CORP	PACHECO	20-49 employees
Contra Costa	CHEVRON CORPORATION	SAN RAMON	5,000-9,999
Contra Costa	PHILLIPS 66 RODEO REFINERY	RODEO	500-999 employees
Contra Costa	GENERAL PETROLEUM	RICHMOND	10-19 employees
Contra Costa	GOLDEN GATE PETROLEUM	RICHMOND	1-4 employees
Contra Costa	GOLDEN GATE PETROLEUM	RICHMOND	1-4 employees
Contra Costa	GOLDEN GATE PETROLEUM	CONCORD	1-4 employees
Contra Costa	NU STAR	MARTINEZ	20-49 employees
Contra Costa	PITCOCK PETROLEUM INC	PLEASANT HILL	10-19 employees
Contra Costa	SHELL MARTINEZ REFINERY	MARTINEZ	500-999 employees
Contra Costa	TESORO GOLDEN EAGLE REFINERY	PACHECO	500-999 employees
Contra Costa	UOP	DANVILLE	1-4 employees
Marin	GRAND PETROLEUM	SAN RAFAEL	1-4 employees
Marin	GREENLINE INDUSTRIES LLC	LARKSPUR	20-49 employees
San Francisco	DOUBLE AA CORP	SAN FRANCISCO	1-4 employees
San Francisco	R B PETROLEUM SVC	SAN FRANCISCO	5-9 employees
San Francisco	SEAYU ENTERPRISES INC	SAN FRANCISCO	5-9 employees
San Mateo	DOUBLE AA CORP	SOUTH SAN FRANCISCO	5-9 employees
San Mateo	SABEK INC	SOUTH SAN FRANCISCO	5-9 employees
San Mateo	SEAPORT REFINING & ENVRNMNTL	REDWOOD CITY	5-9 employees
Santa Clara	COAST OIL CO LLC	SAN JOSE	20-49 employees
Santa Clara	SHELL OIL PRODUCTS US	SAN JOSE	1-4 employees
Solano	BAY AREA DIABLO PETROLEUM CO	BENICIA	1-4 employees
Solano	CAT TECH INC	DIXON	1-4 employees
Solano	DANVILLE PETROLEUM	VALLEJO	5-9 employees
Solano	GOLDEN GATE PETROLEUM	BENICIA	1-4 employees
Solano	RUBICON OIL	BENICIA	1-4 employees
Solano	TIMEC CO INC	VALLEJO	20-49 employees
Solano	VALERO BENICIA REFINERY	BENICIA	250-499 employees
Solano	VALERO REFINING CO	BENICIA	1-4 employees
Solano	VALERO REFINING CO	BENICIA	1-4 employees
Sonoma	BAY AREA DIABLO PETROLEUM CO	CLOVERDALE	1-4 employees
Sonoma	ROYAL PETROLEUM CO INC	PETALUMA	5-9 employees

Source: ADE, Inc., based on California EDD LMID "Employers By Industry" Database

**Response to Comments for the Final Environmental Impact Report for
the Bay Area Air Quality Management District**

Refinery Rules – Draft Rule Amendments Projects

State Clearing House Number: 2018082001

Prepared for:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94105
Contact: David Joe
(415) 749-8623

Prepared By:

Environmental Audit, Inc.
1000-A Ortega Way
Placentia, CA 92870
Contact: Debra Bright Stevens
(714) 632-8521

December 2018

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1.0 INTRODUCTION

This Final Environmental Impact Report (FEIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.). According to CEQA Guidelines, Section 15132, the FEIR shall consist of:

- The Draft Environmental Impact Report (DEIR) or a revision of the Draft;
- Comments and recommendations received on the DEIR either verbatim or in summary;
- A list of persons, organizations, and public agencies comments on the DEIR;
- The responses of the Lead Agency to significant environmental points raised in the review and consultation process; and,
- Any other information added by the Lead Agency.

This Response to Comments, together with other portions of the DEIR as revised, constitutes the FEIR for the proposed Refinery Rules – Draft Rule Amendments Projects.

The DEIR contains detailed projects’ descriptions, the environmental setting for each of the environmental resources topic areas where the Notice of Preparation and Initial Study (NOP/IS) determined there was a potential significant adverse impact, an analysis of the potentially significant environmental impacts including cumulative impacts, projects’ alternatives, mitigation measures, and other areas of discussion as required by CEQA. The discussion of the project-related and cumulative environmental impacts included a detailed analysis of air quality impacts.

The DEIR was released on October 22, 2018 and circulated for a 45-day public review and comment period that ended on December 7, 2018. The DEIR is available at the Bay Area Air Quality Management District (BAAQMD), 375 Beale Street, Suite 600, San Francisco, California 94105. Copies can also be obtained by accessing the BAAQMD's website at <http://www.baaqmd.gov/rules-and-compliance/rule-development/rules-under-development/regulation-6-rule-5>. The BAAQMD received no comment letters on the Draft EIR during the public comment period.

1.1 FORMAT OF THIS DOCUMENT

The Final EIR for the Refinery Rules – Draft Rule Amendments Projects consists of the Draft EIR and its technical appendices; the Responses to Comments included herein; and other written documentation prepared during the EIR process. The District would also consider adoption of a Statement of Findings of Fact and a Statement of Overriding Considerations as part of the approval process for the Projects.

This Response to Comments document is organized as follows:

- Section 1 provides a brief introduction to this document.

- Section 2 identifies the Draft EIR commenters.
- Section 3 provides responses to substantive comments received on the Draft EIR.
- Section 4 presents clarifications to the Draft EIR, identifying revisions to the text of the document.

1.2 CEQA REQUIREMENTS REGARDING COMMENTS AND RESPONSES

CEQA Guidelines Section 15204 (a) outlines parameters for submitting comments, and reminds persons and public agencies that the focus of review and comment of DEIRs should be “on the sufficiency of the document in identifying and analyzing possible impacts on the environment and ways in which significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. At the same time, reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible. CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good-faith effort at full disclosure is made in the EIR.”

CEQA Guidelines Section 15204 (c) further advises, “Reviewers should explain the basis for their comments, and should submit data or references offering facts, reasonable assumptions based on facts, or expert opinion supported by facts in support of the comments. Pursuant to Section 15064, an effect shall not be considered significant in the absence of substantial evidence.” Section 15204 (d) also states, “Each responsible agency and trustee agency shall focus its comments on environmental information germane to that agency’s statutory responsibility.” Section 15204 (e) states, “This section shall not be used to restrict the ability of reviewers to comment on the general adequacy of a document or of the lead agency to reject comments not focused as recommended by this section.”

3.0 RESPONSES TO COMMENTS

This section includes responses to all substantive environmental issues raised in comments received on the Refinery Rules – Draft Rule Amendments Projects. No written comments on the Draft EIR were received during the public review period, and no response is required.

4.0 CHANGES TO THE DRAFT EIR

No changes have been made to the Draft EIR.

**Notice of Public Hearing
and California Environmental Quality Act
Notice of Availability of a Draft Environmental Impact Report
for
Amendments to Refinery Rules (6-5, 11-10, 12-15)**

TO: Interested Parties

FROM: Bay Area Air Quality
Management District
375 Beale St., Suite 600
San Francisco, CA 94105

Lead Agency: Bay Area Air Quality Management District
Contact: Victor Douglas, Manager Phone: (415) 749-4752

SUBJECT: NOTICE OF PUBLIC HEARING AND CEQA NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR PROPOSED AMENDMENTS TO REFINERY RULES: REGULATION 6, RULE 5: PARTICULATE MATTER FROM REFINERY FLUIDIZED CATALYTIC CRACKING UNITS; PROPOSED AMENDMENTS TO REGULATION 11, RULE 10: HEXAVALENT CHROMIUM EMISSIONS FROM ALL COOLING TOWERS AND TOTAL HYDROCARBON EMISSIONS FROM PETROLEUM REFINERY COOLING TOWERS; PROPOSED AMENDMENTS TO REGULATION 12, RULE 15: PETROLEUM REFINING EMISSIONS TRACKING

Notice is hereby given pursuant to California Public Resource Code, Sections 15206 and 15087 (c) that the Bay Area Air Quality Management District ("Air District") has prepared a Draft Environmental Impact Report (EIR) for Amendments to Refinery Rules (6-5, 11-10, 12-15) in accordance with California Environmental Quality Act (CEQA) requirements. Notice is also given that the Board of Directors of the Bay Area Air Quality Management District will conduct a public hearing on December 19, 2018, at the Air District Headquarters' Board Room, 375 Beale Street, San Francisco, California, at 9:45 a.m., or as soon thereafter as the matter may be heard, to consider adoption of the proposed Amendments to Refinery Rules (6-5, 11-10, 12-15) and certification of a final Environmental Impact Report.

Project Title: Amendments to Refinery Rules (6-5, 11-10, 12-15)

State Clearinghouse Number: 2018082001

Project Locations:

Amendments to the three Refinery rules apply within the Bay Area Air Quality Management District ("District"), 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 Descriptions: The Air District is proposing amendments to three previously adopted rules: Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs); Regulation 11, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; and Regulation 12, Rule 15: Petroleum Refining Emissions Tracking.

The proposed amendments to Rule 6-5 include revisions to:

- Clarify exemptions and rule provisions.

The proposed amendments to Rule 11-10 include revisions to:

- Modify and clarify limited exemptions for smaller cooling towers;
- Clarify a limited exemption for cooling towers not in petroleum refining service;
- Modify and clarify leak monitoring, action, and reporting requirements; and
- Remove Best Modern Practices requirements and associated reporting requirements.

The proposed amendments to Rule 12-15 include revisions to:

- Modify and clarify rule definitions and applicability;
- Clarify the annual Emissions Inventory review and approval process;
- Modify and clarify fence-line monitoring plan requirements, and review and approval process;
- Modify the process for updating Emissions Inventory Guidelines and Air Monitoring Guidelines;
- Modify the monthly crude slate report requirements; and
- Modify provisions for designating confidential information.

Significant Impacts: The draft EIR was conducted for all three proposed amended rules as individual projects under CEQA, and the three proposed amended rules are being addressed in a single EIR for administrative convenience. The draft EIR concluded that air quality impacts will be significant because the proposed amendments to Rule 11-10 involve changing existing monitoring requirements for refinery cooling towers, and potential foregone ROG emission reductions as a result of the proposed Rule 11-10 amendments could theoretically exceed significance thresholds. Potential mitigation measures were considered but no feasible mitigation measures have been identified that could avoid the significant impact or reduce the impact to less than significant.

The proposed rule amendments, staff report, and draft EIR are available at the Air District headquarters, on its website at <http://www.baaqmd.gov/ruledev>, or by request. Requests for copies of the proposed amended rules, staff report, or draft EIR should be directed to Karen Fremming (kfremming@baaqmd.gov) at (415) 749-8427.

Comments relating to the proposed amended rules and environmental analysis should be addressed to Victor Douglas, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to vdouglas@baaqmd.gov. Comments on the proposed amended rules and draft EIR will be accepted from October 19, 2018 until December 7, 2018 at 5:00 p.m.

Jack P. Broadbent
Executive Officer
Bay Area Air Quality Management District

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

Refinery Rules - Draft Rule Amendments Projects

Prepared for:

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September 2018

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INTRODUCTION AND EXECUTIVE SUMMARY

Introduction

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

Executive Summary: Chapter 4 – Alternatives Analysis

Executive Summary: Chapter 5 - References

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District or Air 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 Air District is also required to meet state standards by the earliest date achievable.

The Air District is preparing the Refinery Rules - Draft Rule Amendments Projects (projects or proposed projects). The projects involve developing draft amendments to previously adopted rules: Regulation 6, Rule 5 - Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs); Regulation 11, Rule 10 - Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; and Regulation 12, Rule 15 - Petroleum Refining Emissions Tracking. The draft amendments are being proposed to settle two lawsuits: (1) one filed against the Air District by three of the five Bay Area refineries that challenged the approval Rules 6-5, Rule 8-18, and Rule 11-10; and (2) one filed against the Air District by the Western States Petroleum Association (WSPA) and three refineries that challenged the approval of Rule 12-15.

1.2 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 Air District has prepared this Environmental Impact Report (EIR) under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the proposed Refinery Rules - Draft Rule Amendments. Prior to making a decision on the adoption of the proposed projects, the Air District Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed Refinery Rules - Draft Rule Amendments. The various projects are being addressed in a single EIR for administrative convenience since they are being proposed for adoption in the same hearing. However, the projects are not interdependent – the Air District Governing Board will make separate and independent decisions on each of the proposed rules.

1.2.1 NOTICE OF PREPARATION/INITIAL STUDY

A Notice of Preparation for the Draft EIR for the Refinery Rules - Draft Rule Amendments Project was distributed to responsible agencies and interested parties for a 30-day review on August 1, 2018 through September 7, 2018. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the Air District's web site and was also published in newspapers throughout the area of the Air District's jurisdiction. A public scoping

meeting was held at the District headquarters on August 20, 2018. Two public comment letters were submitted on the NOP to the Air District and are included in Appendix A of this EIR. Three verbal comments were received at the Scoping Meeting, and were addressed as described in the document included in Appendix A.

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

1.2.2 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 effect 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 the Refinery Rules - Draft Rule Amendments 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). The Refinery Rules - Draft Rule Amendments would apply to the five refineries within the Bay Area, amending previously approved refinery rules.

1.2.3 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 Air District’s Board of Directors and the public with information on the environmental effects of the proposed projects; and, (b) be used as a tool by the Air District’s Board to facilitate decision making on the proposed projects.

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

1. A list of the agencies that are expected to use the EIR in their decision-making;

2. A list of permits and other approvals required to implement the projects; and
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

There are no State, federal or local permits required to adopt the proposed amendments to Rules 6-5, 11-10, or 12-15. Local public agencies, such as cities, and counties could be expected to utilize this EIR if local approval is required for refinery modifications due to the proposed Rule 6-5, 11-10, and 12-15 amendments, pursuant to CEQA Guidelines §15152. However, implementation of the proposed rules amendments is not expected to result in new facilities, construction activities, or any substantial refinery modifications at the refineries. Therefore, the proposed rule amendments are not expected to require permits from local governments (e.g., cities and counties with land use approval).

1.2.4 AREAS OF POTENTIAL CONTROVERSY

In accordance with 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. The Refinery rules evaluated in this EIR have been the subject of two lawsuits that have raised concerns that the previous approvals of the rules violated CEQA and its implementing regulations; certain provisions of the California Health and Safety Code; and California common law. The District is proposing amendments to the Refinery rules in order to respond to some of these concerns.

1.3 EXECUTIVE SUMMARY: CHAPTER 2 – PROJECT DESCRIPTIONS

The District’s proposed rule amendments aim to amend Rules 6-5, Rule 11-10, and Rule 12-15. The draft amendments to Rule 6-5 would apply to four of the five Bay Area refineries with FCCUs. The draft amendments to Rule 11-10 and Rule 12-15 would apply to all five Bay Area refineries.

1.3.1 PROJECTS’ OBJECTIVES

The objectives of Refinery Rules - Draft Rule Amendments are to:

- Resolve legal challenges to Rules 6-5, 11-10, and 12-15;
- Clarify language in the currently approved versions of Rules 6-5, 11-10, and 12-15 to provide better understanding of the requirements, and easier implementation of the rules;
- Assure that Rules 6-5, 11-10, and 12-15 can be implemented consistently;
- Reduce the emissions of ozone precursors (ROG) to help achieve the federal and state ambient air quality standards for ozone;

- Reduce emissions of particulate matter to help achieve the state ambient air quality standards for PM₁₀ and PM_{2.5};
- Accurately and consistently characterize emissions from refinery-related emissions sources in an on-going basis to determine if additional emission reductions can be achieved;
- Determine if significant changes to the crude slate result in increased emissions of air pollutants;
- Ensure refineries comply with the ambient air quality standards for PM₁₀ and PM_{2.5}; and
- Provide information to the public on refinery emissions, and significant crude slate changes.

1.3.2 SOURCES AFFECTED BY THE REFINERY RULES - DRAFT RULE AMENDMENTS

A summary of the expected methods of compliance for Rules 6-5, 11-10 and 12-15 are provided below.

- **Draft Amendments Rule 6-5 – Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs):** The draft amendments to Rule 6-5 apply to four of the five Bay Area refineries with FCCUs. The draft amendments clarify exemptions to the rule (it does not apply to FCCUs with wet scrubbers) and deletes placeholders in the existing rule for future limits on condensable matter and sulfur dioxide. The draft amendments to Rule 6-5 would have no impact on emissions as the amendments are clarifications of the original intent of Rule 6-5.
- **Draft Amendments to Rule 11-10 – Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers:** Compliance with the amendments to Rule 11-10 is expected to be through improved and more stringent monitoring and more immediate repair of leaking heat exchangers. Amendments to Regulation 11-10 would require cooling towers to be sampled once every week (rather than once every day under the currently approved rule) and that leaks be minimized as soon as practicable or within seven calendar days (rather than five). Amendments to Regulation 11-10 would also exempt smaller cooling towers not in petroleum refining service and would provide the potential for less frequent monitoring for smaller cooling towers after the cooling towers demonstrate a consistent pattern with no leaks. The draft amendments to Rule 11-10 may impact emissions relative to the rule as adopted due to reduced frequency in monitoring and potential leak detection.
- **Draft Amendments to Rule 12-15 - Petroleum Refining Emissions Tracking:** The Proposed Amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan requirements,

procedures for updating guidelines, crude slate reporting requirements, and confidential information designation procedures. Rule 12-15 is an emissions reporting rule, so no controls are required, no impacts on emissions is expected and no physical impacts to the refineries would occur.

The impacts of these expected methods of compliance are evaluated in this EIR. CEQA recognizes that regulatory requirements consisting of monitoring and inspections, do not typically generate physical adverse environmental impacts (see for example, CEQA Guidelines §15309).

1.4 EXECUTIVE SUMMARY: CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the Refinery Rules - Draft Rule Amendments and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for Air Quality, which was the only environmental area identified in the Initial Study (see Appendix A). Included for each impact category is a discussion of the environmental setting, significance criteria, whether the proposed rule amendments will result in any significant impacts (either individually or cumulatively in conjunction with other projects), and feasible project-specific mitigation (if necessary and available).

1.4.1 AIR QUALITY

1.4.1.1 Air Quality Setting

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards (AAQS) 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 (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The long-term trend of ambient concentrations of air pollutants and the number of days on which the region exceeds (AAQS) have generally declined, although some year-to-year variability primarily due to meteorology, causes some short-term increases in the number of exceedance days (see Table 3.2-3). The Air District is in attainment of the State AAQS for CO, NO₂, and SO₂. However, the Air District does not comply with the State 24-hour PM₁₀ standard. The Air District is unclassifiable/attainment for the federal CO, NO₂, SO₂, Pb, and PM₁₀ standards. A designation of unclassifiable/attainment means that EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

In 2017, air quality monitoring data indicate that no monitoring stations measured an exceedance of any of the state or federal AAQS for CO and SO₂. There was one exceedance of the federal NO₂ AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM₁₀ standards. The California 24-hour PM₁₀ standard was exceeded on six days in 2017, at the San Jose monitoring station (see Table 3.2-2).

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour PM_{2.5} standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 24-hour PM_{2.5} standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

1.4.1.2 Air Quality Impacts

The proposed amendments to Rule 6-5 provide clarifications to the existing rule and would not require any physical changes to the existing refineries; thus, no impacts to air quality are expected. The proposed amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, as well as changes to language and reporting requirements. No physical modifications are required, no emission control is required, and thus no air emissions changes would occur.

Rule 11-10 has been implemented under the terms of the proposed settlement agreement. Proposed amendments to Rule 11-10 have been developed to formalize how Rule 11-10 has actually been implemented. The proposed amendments to Rule 11-10 require weekly monitoring, with potential adjustments to twice-monthly monitoring (i.e. two samples per month). These proposed amendments are estimated to reduce ROG emissions to as low as 64 tpy. While less stringent than daily monitoring, weekly monitoring remains substantially more stringent than monthly monitoring. Changing monitoring frequency as proposed in amendments to Rule 11-10 does not result in an increase in actual emissions because the amendments are consistent with how the Rule has been implemented since adoption. However, the change in monitoring frequency, when compared to the rule language as adopted, can theoretically allow for an emissions impact since less frequent monitoring may allow a potential future leak to go undetected for a longer period of time.

The Air District's position is that a theoretical impact of increased emissions relative to the rule language that was never implemented does not require analysis under CEQA. However, for the sake of transparency and thoroughness, the Air District is analyzing these theoretical impacts so that the public understands the difference between the rule as it was adopted (though not implemented) and the rule as proposed. Staff estimates the foregone emissions reductions that could theoretically occur when monitoring weekly rather than daily range from 1 tpy to 16 tpy depending on the method used to estimate emission factors for each monitoring frequency. This Draft Environmental Impact Report has been developed to further analyze the environmental impacts. CEQA Guidelines indicate that cumulative impacts of a Project shall be discussed when the Project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines

§15065(c). The cumulative air quality impacts of the proposed Project have been evaluated in this Draft EIR.

The proposed amendments to Rule 11-10 involve changing existing monitoring requirements for refinery cooling towers. Based on the analysis conducted in subchapter 3.2, the greatest impact is the potential for foregone ROG emission reductions as a result of the proposed project could theoretically exceed the significance threshold of 10 tons per year when compared to the rule as adopted, but not implemented. Since the operational ROG emissions would exceed the significance threshold, ROG emissions are an ozone precursor, and the district is not in attainment for ozone; the proposed amendments to Rule 11-10 may contribute to an existing or projected air quality violation. The proposed amendments to Rule 11-10 could result in ROG emission reductions foregone from the existing Rule 11-10 (as adopted, but not implemented) that exceed the operational ROG significance threshold of 10 tons per year.

The only feasible method to reduce ROG emissions from cooling towers is more frequent monitoring and repair, but this method was concluded to not be feasible due to economic factors as per CEQA Guidelines §15364. Thus, no feasible mitigation measures have been identified that could avoid the significant impact or reduce the impact to less than significant.

Heat exchanger leaks can occur from any refinery unit and could include any type of organic compound present at refineries, including those TACs that are commonly emitted from refineries. The potential ROG emissions forgone associated with the proposed amendments to Rule 11-10 are estimated to be range from 1 ton per year to 16 tons per year depending on the method used to estimate emission factors for each monitoring frequency, some of which would likely be TAC emissions. However, the unit that may leak, location of the leak, the sources of the leak, and the type of material/product that may leak is unknown and cannot be estimated or predicted with any certainty. The type of TACs emitted and the quantity emitted are also unknown and the potential impacts from TAC emissions foregone are considered to be speculative and no further evaluation of TAC impacts will be provided (CEQA Guidelines §15145).

1.5 EXECUTIVE SUMMARY: CHAPTER 4 – ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed projects 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, one of the proposed projects could result in potentially significant impacts due to ROG emission reductions “foregone” under the proposed amendments to Rule 11-10. 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 - No Project Alternative would theoretically reduce the potentially significant impacts associated with operational emissions increases under Rule 11-10, i.e., ROG emission reductions foregone. However, Alternative 1 is not feasible because the implementation of Rule 11-10 as currently approved is not feasible due to economic and technological factors. The

implementation of the currently approved Rules 6-5, 11-10, and 12-15 could result in the continuation of legal challenges to the rules under Alternative 1, although the outcome of the court decision cannot be determined at this time. Further, Alternative 1 would achieve three of the nine project objectives.

Under Alternative 2, the proposed amendments to Regulations 6-5 and 12-15 would be implemented, but not the proposed amendments to Regulation 11-10. The impacts under Alternative 2, would essentially be the same as the No Project Alternative because the proposed amendments to Rules 6-5 and 12-15 would not result in any significant air impacts issues (no construction or operational air emissions). Under Alternative 2, Rule 11-10 would not be implemented which would theoretically eliminate the ROG emission reductions foregone. However, implementing Rule 11-10 as currently approved is not considered to be feasible due to economic and technological factors. The implementation of the currently approved Rule 11-10 could result in the continuation of legal challenges to the rules under Alternative 2, although the outcome of the court decision cannot be determined at this time. Alternative 2 would better achieve the project objectives than Alternative 1 but the project objectives associated with Rule 11-10 would not be achieved.

Under Alternative 3 and Alternative 4, the monitoring frequency of Rule 11-10 would be modified to a weekly monitoring schedule, but the option to go to an extended sampling schedule if sampling results are below the Leak Action Level would be removed. This would help minimize the time it takes to discover and repair a leak. Rules 6-5 and 12-15 would be implemented as currently proposed. Under Alternative 3, the theoretical ROG emission reductions foregone associated with Rule 11-10 would be reduced from 0.1 to 0.5 tons per year. However, Alternative 3 is found to not be feasible because these emission reductions are not adequate to reduce the foregone emission reductions to less than 10 tons per year. Under Alternative 4, the theoretical ROG emissions foregone associated with Rule 11-10 would be reduced from 0.4 to 6.1 tons per year. However, Alternative 4 is found to not be feasible because these emission reductions are not adequate to reduce the foregone emission reductions to less than 10 tons per year. Neither Alternative 3 nor Alternative 4 are feasible based on cost impacts, and are not adequate to reduce emissions impacts to less than significant. Alternative 3 and Alternative 4 would achieve the objectives of the various projects, with the potential exception of the resolving the legal challenges associated with Rule 11-10.

Alternative 1 would not eliminate the potentially significant ROG impacts to less than significant and would not achieve any of the objectives of the proposed projects (not feasible due to economic and technological factors). Alternative 2 would also not reduce the potentially significant ROG impacts to less than significant but would achieve most of the objectives of the projects. Alternative 3 and Alternative 4 would reduce the ROG impacts (but not to less than significant) and achieve most of the objectives of the projects. Since Alternative 3 and Alternative 4 would reduce the ROG impacts and achieve most of the objectives of the projects, they would be considered the environmentally superior alternative (although they are not economically feasible). The proposed projects would be considered the preferred alternative as they would achieve all of the objectives.

1.6 EXECUTIVE SUMMARY: CHAPTER 5 - REFERENCES

Chapter 5 provides the references used in the preparation of the EIR.

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

Impact	Mitigation Measures	Residual Impacts
Air Quality		
No construction activities are expected to be required to implement the proposed amendments to Rules 6-5, 11-10, and 12-15, so no construction air quality impacts are expected.	None Required	None
Operational activities that may be required to implement Rules 6-5 and 12-15 are not expected to result in any emission increases of any air pollutants, including ROG, CO, SO _x , NO _x , PM ₁₀ and PM _{2.5} .	None Required	None
The proposed amendments to Rule 11-10 would go from daily monitoring to weekly monitoring. The potential ROG emissions foregone as a result of the proposed amendments could theoretically exceed the significance threshold of 10 tons per year. Since ROG emissions are an ozone precursor, and the district is not in attainment for ozone; the proposed amendments to Rule 11-10 may contribute to an existing or projected air quality violation, and it may diminish an existing air quality rule or future compliance requirement resulting in a significant air quality impact.	The only feasible method to reduce ROG emissions from cooling towers is more frequent monitoring and repair, but this method was concluded to not be feasible due to economic factors per CEQA Guidelines §15364. Thus, no feasible mitigation measures have been identified that could avoid the significant impact or reduce the impact to less than significant.	Operational emissions of ROG could remain significant due to the potential ROG emission reductions foregone under Rule 11-10. No emission increases are expected for NO _x , SO _x , CO, PM ₁₀ , or PM _{2.5} .
No TAC emissions are associated with implementation of the proposed amendments to Rules 6-5 and 12-15. The potential TAC emissions associated with implementing the proposed amendments to Rule 11-10 are considered to be speculative.	None Required	None

1-10

CHAPTER 2

PROJECT DESCRIPTIONS

Introduction

Projects' Locations

Projects' Objectives

Background

Project Descriptions

Sources Affected by the Refinery Rules - Draft Rule Amendments

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2.0 PROJECT DESCRIPTIONS

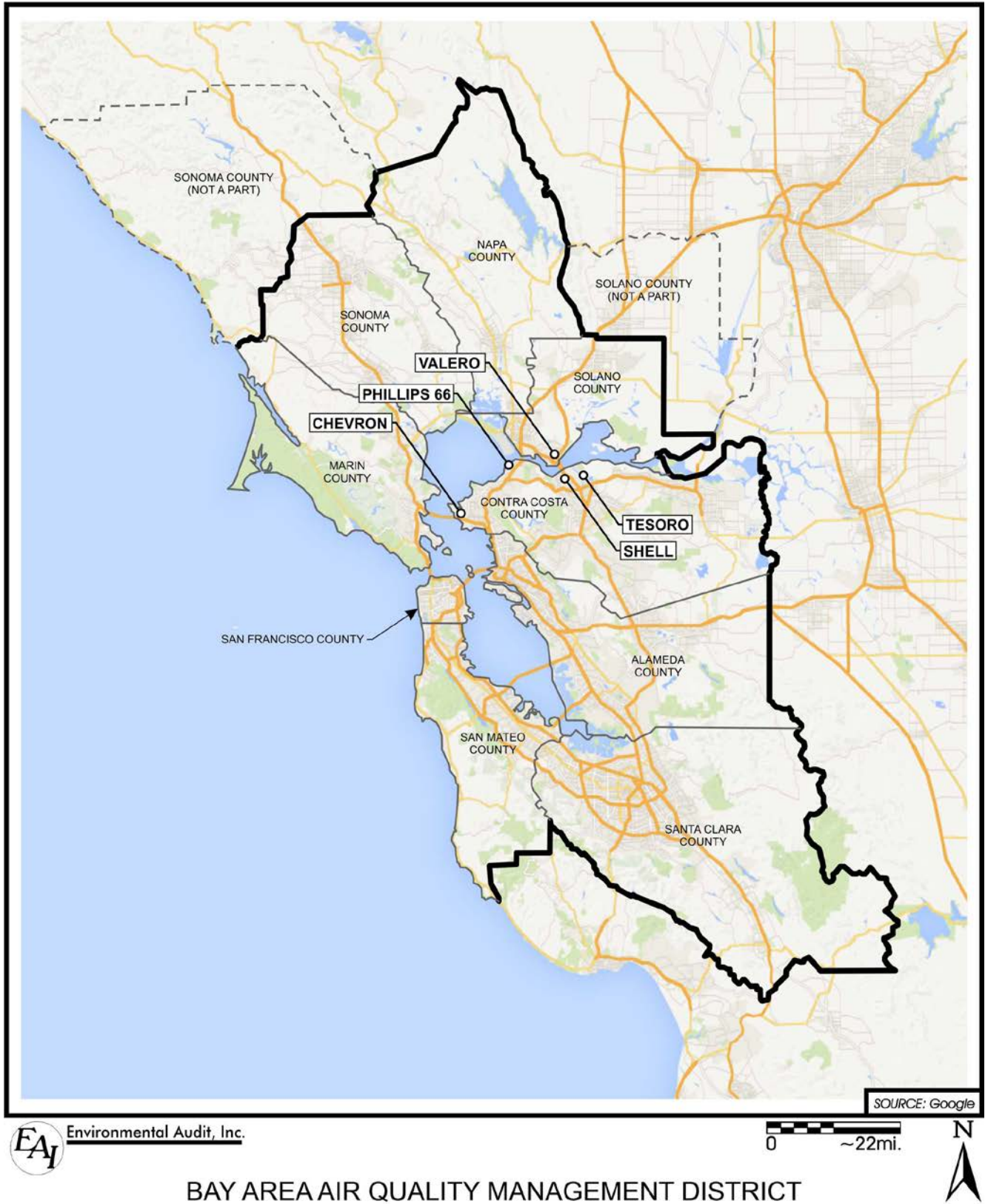
2.1 INTRODUCTION

The Bay Area Air Quality Management District (District or Air 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 Air District is also required to meet state standards by the earliest date achievable.

The Air District is preparing the Refinery Rules – Draft Rule Amendments Projects (projects or proposed projects). The projects involve developing draft amendments to previously adopted rules: Regulation 6, Rule 5 - Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs); Regulation 11, Rule 10 - Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; and Regulation 12, Rule 15 - Petroleum Refining Emissions Tracking. The draft amendments are being proposed to settle two lawsuits: (1) one filed against the Air District by three of the five Bay Area refineries that challenged the approval of Rules 6-5, Rule 8-18, and Rule 11-10; and (2) one filed against the Air District by the Western States Petroleum Association (WSPA) and three refineries that challenged the approval of Rule 12-15.

2.2 PROJECTS' LOCATIONS

The Air District 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). The proposed Refinery Rules - Draft Rule Amendments would affect the five refineries within the Bay Area, the locations of which are shown on Figure 2.2-1.



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

2.3 PROJECTS' OBJECTIVES

The objectives of Refinery Rules - Draft Rule Amendments are to:

- Resolve legal challenges to Rules 6-5, 11-10, and 12-15;
- Clarify language in the currently approved versions of Rules 6-5, 11-10, and 12-15 to provide better understanding of the requirements, and easier implementation of the rules;
- Assure that Rules 6-5, 11-10, and 12-15 can be implemented consistently;
- Reduce the emissions of ozone precursors (ROG) to help achieve the federal and state ambient air quality standards for ozone;
- Reduce emissions of particulate matter to help achieve the state ambient air quality standards for PM₁₀ and PM_{2.5};
- Accurately and consistently characterize emissions from refinery-related emissions sources in an on-going basis to determine if additional emission reductions can be achieved;
- Determine if significant changes to the crude slate result in increased emissions of air pollutants;
- Ensure refineries comply with the ambient air quality standards for PM₁₀ and PM_{2.5}; and
- Provide information to the public on refinery emissions, and significant crude slate changes.

2.4 BACKGROUND

The District is developing draft amendments to two of three rules that were adopted by the Air District Board of Directors on December 16, 2015. These rules were challenged by three of the five Bay Area refineries in a lawsuit that was filed on January 22, 2016, *Valero, et al. v. Bay Area Air Quality Management District* (case number N16-0095), and amended on February 16, 2016. On March 24, 2017, the parties to the lawsuit entered an enforcement agreement and agreement to stay litigation for all three of these regulations (referred to as the “Valero Case Agreement”). Terms of the Agreement affect implementation of Rule 6-5, Rule 8-18, and Rule 11-10. This document will use the phrase “2016 Refinery Rules” when referring to these three rules collectively. Specifically, the Air District committed in the Agreement to implement the three rules that were challenged for a limited period of time in a manner consistent with how the rules would be proposed to be changed. The intent of this provision is that the refineries should not have to implement in the near-term

provisions that will change if the rules are amended as contemplated in the Agreement. If the rules are not changed as contemplated in the Valero Case Agreement, the refineries will have to implement the rules as originally adopted in 2016. In that scenario, the refineries could reactivate their lawsuit and move forward with their legal challenge to the 2016 Refining Rule.

The Agreement states the Air District will propose amendments to the 2016 Refinery Rules for adoption by the Air District Board of Directors by November 1, 2018. Draft amendments to Rule 8-18 – Equipment Leaks are not being proposed at this time, and will be delayed until a Refinery Heavy Liquids Fugitive Leaks study can be completed at all five Bay Area refineries. This study has been underway and findings are expected to be finalized in late 2018. Information from the study will be used to determine appropriate amendments for Rule 8-18, which are expected in Spring 2019.

In addition, the Air District is developing draft amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (Rule 12-15), adopted by the Air District Board of Directors on April 20, 2016. Rule 12-15 was challenged in a lawsuit that was filed by the Western States Petroleum Association (WSPA) and three of the refineries individually on May 25, 2016, *WSPA, et al. v. Bay Area Air Quality Management District* (case number N16-0963). Similar to the Valero Case Agreement, parties to the lawsuit have entered an agreement to stay the WSPA case litigation contingent on the Air District proposing specified amendments to Rule 12-15 (but not Rule 9-14). This agreement, entered into as of March 1, 2018, will be referred to as the “WSPA Case Agreement.” Similar to the Valero Case Agreement, in the WSPA Case Agreement the Air District committed to implement Rule 12-15 for a limited period of time in a manner consistent with how Rule 12-15 would be changed as contemplated in the Agreement. The intent of this provision is that the refineries should not have to implement in the near-term provisions that will change if Rule 12-15 is amended as contemplated in the Agreement. If Rule 12-15 is not changed as contemplated in the Agreement, the refineries will have to implement Rule 12-15 as originally adopted. In that scenario, the refineries could reactivate their lawsuit and move forward with their legal challenge to Rule 12-15.

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).

2.5 PROJECT DESCRIPTIONS

The District’s proposed rule amendments aim to amend Rules 6-5, Rule 11-10, and Rule 12-15. The draft amendments to Rule 6-5 would apply to four of the five Bay Area refineries with FCCUs. The draft amendments to Rule 11-10 and Rule 12-15 would apply to all five Bay Area refineries.

CHAPTER 2: PROJECT DESCRIPTION

The draft amendments to Regulation 6, Rule 5 (Rule 6-5) - Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs) include revisions to clarify exemptions and rule provisions.

The draft amendments to Regulation 11, Rule 10 (Rule 11-10) - Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers include revisions to:

- Modify and clarify limited exemptions for smaller cooling towers;
- Clarify a limited exemption for cooling towers not in petroleum refining service;
- Modify and clarify leak monitoring, action, and reporting requirements; and,
- Remove Best Modern Practices requirements and associated reporting requirements.

The draft amendments Regulation 12, Rule 15 (Rule 12-15) - Petroleum Refining Emissions Tracking include revisions to:

- Modify and clarify rule definitions and applicability;
- Clarify the Annual Emissions Inventory review and approval process;
- Modify and clarify fence-line monitoring plan requirements, and review and approval process;
- Modify the process for updating Emissions Inventory Guidelines and Air Monitoring Guidelines;
- Modify the monthly crude slate report requirements; and,
- Modify provisions for designating confidential information.

These proposed rule amendments are described in the following subsections.

2.5.1 DRAFT AMENDMENTS TO RULE 6-5 – PARTICULATE EMISSIONS FROM REFINERY FLUIDIZED CATALYTIC CRACKING UNITS (FCCUs)

The draft amendments to Rule 6-5 include revisions to provide more clarity and conciseness to Section 6-5-111 - Exemption, Emissions Abated by Wet Scrubber and Section 6-5-301 - FCCU Emission Limits. The rule would not apply to refineries that operate wet gas scrubbers on their FCCUs. Placeholders for future limits regarding Condensable Particulate Matter and Sulfur Dioxide (SO₂) were deleted. Both of these changes reflect changes in language for clarity purposes and do not represent substantive changes to Rule 6-5.

2.5.2 DRAFT AMENDMENTS TO RULE 11-10 – HEXAVALENT CHROMIUM EMISSIONS FROM ALL COOLING TOWERS AND TOTAL HYDROCARBON EMISSIONS FROM PETROLEUM REFINERY COOLING TOWERS

The draft amendments to Rule 11-10 include revisions to modify limited exemption requirements; modify and clarify leak monitoring, action, and reporting requirements; and, remove modern practice requirements and reporting.

Proposed amendments to Rule 11-10 have been developed to codify how Rule 11-10 has actually been implemented under the terms of the Valero Case Agreement. The proposed amendments to Rule 11-10 require weekly monitoring, with potential adjustments to twice-monthly monitoring (i.e. two samples per month). These proposed amendments are estimated to reduce ROG emissions to as low as 64 tpy. While less stringent than daily monitoring, weekly monitoring remains substantially more stringent than monthly monitoring. Changing monitoring frequency as proposed in amendments to Rule 11-10 does not result in an increase in actual emissions because the amendments are consistent with how the Rule has been implemented since adoption. However, the change in monitoring frequency, when compared to the rule language as adopted, can theoretically allow for an emissions impact since less frequent monitoring may allow a potential future leak to go undetected for a longer period of time.

The Air District's position is that a theoretical impact of increased emissions relative to the rule language that was never implemented does not require analysis under CEQA. However, for the sake of transparency and thoroughness, the Air District is analyzing these theoretical impacts so that the public understands the difference between the rule as it was adopted (though not implemented) and the rule as proposed. Staff estimates the foregone emissions reductions that could theoretically occur when monitoring weekly rather than daily range from 1 tpy to 16 tpy depending on the method used to estimate emission factors for each monitoring frequency.

Limited Exemptions for Smaller Cooling Towers: This amendment requires cooling towers with water recirculation rates of less than 2,500 gallons per minute (gpm) to be monitored once every week instead of every day. Operators may also move to a monthly monitoring schedule if results are below the Leak Action Level for four consecutive weeks.

Limited Exemptions for Very Small Cooling Towers: This amendment requires cooling towers with water recirculation rates of less than 500 gallons per minute (gpm) to be monitored once every week instead of every other week. Operators may also move to a monthly monitoring schedule if results are below the Leak Action Level for four consecutive weeks.

Limited Exemption for Cooling Towers Not in Petroleum Refining Service: This amendment is to clarify that cooling towers not in petroleum refining service are exempt from Rule 11-10.

Leak Monitoring, Action, and Reporting Requirements: An amendment to total hydrocarbon leak monitoring will require cooling towers with water recirculation rates of more than 2,500 gallons per minute (gpm) to be sampled once every week instead of once every day. Operators will be able to do a twice-monthly sampling schedule if sampling results are below the Leak Action Level for six consecutive months. Further, leak action requirements will be amended to require cooling tower hydrocarbon leaks to be minimized as soon as practicable or within seven calendar

days (rather than five calendar days) to provide time for necessary leak minimization sampling and analysis delays associated with potential technical and/or safety constraints.

Finally, an amendment to Refinery cooling tower reporting requirements clarifies that sampling of the cooling tower water must occur as soon as feasible, and no later than 24 hours from the discovery of the leak. This has been amended to require notification to the District's Air Pollution Control Officer (APCO) of total hydrocarbon concentration and chlorine concentration within 72 hours (rather than one calendar day) of discovering the leak. The draft amendment also removes the requirements to report lists of all heat exchangers served by the cooling tower, as well as the pH level and iron concentration of the cooling water, as this reporting is unlikely to provide additional substantive information regarding the hydrocarbon emissions from the cooling tower. Notification requirements are also being added for any delays in repair must meet the criteria cited in 40 CFR 63.654(f)-(g), as referenced in amended Section 11-10-305.

Best Modern Practices Requirements and Reporting: Section 11-10-402: The requirement to employ Best Modern Practices is being deleted to avoid potential duplication and conflicts with process safety management requirements. Section 11-10-504: Operating Records is being amended to remove recordkeeping requirements associated with the deleted Section 11-10-402, as these recordkeeping requirements are no longer applicable.

2.5.3 DRAFT AMENDMENTS TO RULE 12-15 – PETROLEUM REFINING EMISSIONS TRACKING

The draft amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan requirements, procedures for updating guidelines, crude slate reporting requirements, and confidential information designation procedures, as described below.

Rule Definitions and Applicability: The definitions of crude oil and crude oil blends have been changed to provide clarity. The requirement to include emissions from cargo carriers (ships and trains) in the emissions inventory data has been removed as they are not under the control or authority of the refineries. The definition of monthly crude slate report is being amended to address concerns from the refineries regarding the burden of providing information on non-crude feedstocks. Non-crude feedstocks are introduced at refineries across a vast spectrum of uses and is often in very small quantities. In order to maintain the intent of the Rule, a threshold is established below which non-crude feedstocks need not be addressed in the crude slate report.

Emission Factors and Calculation Methodology: Section 12-15-401 - Annual Emissions Inventory is being amended to clarify the calculation methodology to be used for calculating greenhouse gases using a “common pipe” method.

Annual Emissions Inventory Review and Approval Process: This section is being amended to clarify the process for communicating and issuing preliminary review determinations under Subsection 12-15-402.1. The draft amendment also clarifies the notification process for the Air District’s review period under Subsection 12-15-402.3, and sets a limit of 45 days for the extension of the review period.

Fence-line Monitoring Plan Requirements and Review Process: Air Monitoring Plan requirements are being amended to clarify that site-specific air monitoring plans will be allowed to have implementation schedules and dates that are tailored to the specific plan, due to the unique set of circumstances of each individual refinery. The process for issuing preliminary review determinations has also been amended for clarity. Finally, amendments to Section 12-15-501 - Fence-line Monitoring System clarify that the requirements of the section will be effective once the fence-line monitoring system is installed and operational.

Update of Emissions Inventory Guidelines and Air Monitoring Guidelines: Draft amendments to the guideline update process include a 60-day comment period for affected facilities to review and comment on changes to the Emissions Inventory Guidelines and Air Monitoring Guidelines. Further, the Air District will respond to comments received. Affected facilities will be given at least 90 days to implement changes from the updated Emissions Inventory Guidelines in their respective annual emissions inventories.

Monthly Crude Slate Report Requirements: Section 12-15-408 - Availability of Monthly Crude Slate Reports is being amended to validate that the historical monthly crude slate data required for years 2013, 2014, 2015, and 2016 will be based on records maintained by the refinery in the normal course of business. The draft amendments to this subsection also define precautions and procedures for handling confidential data for inspection, audit, and review. The draft amendments ensure that refinery confidential data is protected appropriately, and remains on-site at the refinery and is prevented from inadvertent release. Subsection 12-15-408.2 is being amended to modify the summarized information required in the monthly crude slate report.

Designation of Confidential Information: Requirements regarding confidential information have been amended to defer to the amended Sections 12-15-209 and 408. The requirements for an owner/operator to provide a redacted version of the document have been removed. Additionally, crude slate reports will not be required to be submitted to the Air District.

2.6 SOURCES AFFECTED BY THE REFINERY RULES - DRAFT RULE AMENDMENTS

A summary of the expected methods of compliance for Rules 6-5, 11-10 and 12-15 are provided below.

- **Draft Amendments Rule 6-5 – Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs):** The draft amendments to Rule 6-5 apply to four of the five Bay Area refineries with FCCUs. The draft amendments clarify exemptions to the rule (it does not apply to FCCUs with wet scrubbers) and deletes placeholders in the existing rule for future limits on condensable particulate matter and sulfur dioxide. The draft amendments to Rule 6-5 would have no impact on emissions as the amendments are clarifications of the original intent of Rule 6-5.
- **Draft Amendments to Rule 11-10 – Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers:** Compliance with the amendments to Rule 11-10 is expected to be through improved and more stringent monitoring and more rapid repair of heat exchanges leaking ROG into cooling water. Amendments to Regulation 11-10 would require cooling towers to be sampled once every week (rather than once every day as in the currently adopted rule) and that leaks be minimized as soon as practicable or within seven calendar days (rather than five under the currently adopted rule). Amendments to Regulation 11-10 would also exempt smaller cooling towers not in petroleum refining service and would provide for less frequent monitoring of smaller cooling towers. The draft amendments to Rule 11-10 may impact emissions relative to the rule as adopted due to reduced frequency in monitoring and potential leak detection.
- **Draft Amendments to Rule 12-15 - Petroleum Refining Emissions Tracking:** The Proposed Amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan requirements, procedures for updating guidelines, crude slate reporting requirements, and confidential information designation procedures. Rule 12-15 is an emissions reporting rule, so no controls are required, no impacts on emissions is expected and no physical impacts to the refineries would occur.

The impacts of these expected methods of compliance are evaluated in this EIR. CEQA recognizes that regulatory requirements consisting of monitoring and inspections, do not typically generate environmental impacts (see for example, CEQA Guidelines §15309).

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES, AND CUMULATIVE IMPACTS

Introduction
Air Quality
Other CEQA Sections

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3.0 ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS

3.1 INTRODUCTION

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of implementing the Refinery Rules - Draft Rule Amendments, and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study prepared by the Air District for the Draft Amendments to the Refinery Rules (BAAQMD, 2018) (see Appendix A). The Initial Study concluded that the approval of Refinery Rules - Draft Rule Amendments (specifically Rule 11-10) could potentially result in significant environmental impacts to Air Quality.

The potential impacts identified in the Initial Study will be evaluated in this EIR. Included for each impact category is a discussion of the: (1) Environmental Setting; (2) Regulatory Setting; (3) Significance Criteria; (4) Environmental Impacts; (5) Mitigation Measures (if necessary and available); and (6) Cumulative Impacts. A description of each subsection follows.

3.1.1 ENVIRONMENTAL SETTING

CEQA Guidelines §15360 (Public Resources Code Section 21060.5) defines “environment” as “the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance.” CEQA Guidelines §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting is intended to be no longer than is necessary to gain an understanding of the significant effects of the proposed project and its alternatives.

This Chapter describes the existing environment in the Bay Area as it exists at the time the environmental analysis commenced (2018) to the extent that information is available. 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 Refinery Rules - Draft Rule Amendments 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 projects. The NOP/IS (see Appendix A) determined that air quality impacts associated with the proposed amendments were potentially significant and are evaluated in this EIR.

3.1.2 SIGNIFICANCE CRITERIA

This section identifies the criteria used to determine when physical changes to the environment created as a result of approval of the proposed projects 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 CEQA environmental checklist and the Air Districts CEQA Air Quality Guidelines (BAAQMD, 2017a).

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

3.1.3 ENVIRONMENTAL IMPACTS

The CEQA Guidelines also require the EIR to identify significant environmental effects that may result from a proposed project (CEQA Guidelines §15126.2(a)). Direct and indirect significant effects of a project on the environment must be identified and described, with consideration given to both short- and long-term impacts. The potential impacts associated with each resource 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 may also apply to individual projects at the time any permits are submitted in the future in response to the regulation or regulations that may be approved by the Board and the potential for any control equipment or other design modifications to affected facilities to have secondary adverse environmental impacts will be evaluated at that time.

3.1.4 MITIGATION MEASURES

If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4). The analyses in this chapter describe the potential for significant adverse impacts and identify mitigation measures where appropriate. 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 2017 Clean Air Plan, the most recent air plan for the Bay Area (BAAQMD, 2017b). In addition, the District is considering amendments to Regulation 8, Rule 18: Equipment Leaks (Rule 8-18) as part of the Valero Case Agreement. Draft amendments to Rule 8-18 are not being proposed until a Refinery Heavy Liquids Fugitive Leaks study can be completed at all five Bay Area refineries. This study has been underway and findings are expected to be finalized in late 2018. Information from the study will be used to determine appropriate amendments for Rule 8-18, expected in Spring 2019. The implementation of amendments to Rule 8-18 will also be included as a cumulative project.

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.

CHAPTER 3.2

AIR QUALITY IMPACTS

Environmental Setting
Regulatory Setting
Significance Criteria
Environmental Impacts
Mitigation Measures
Cumulative Impacts

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3.2 AIR QUALITY

This subchapter of the EIR evaluates the potential air quality impacts associated with implementation of the Refinery Rules - Draft Rule Amendments, which include projects to amend Rule 6-5, Rule 11-10, and Rule 12-15, designed to reduce emissions from refinery operations.

As discussed in the Initial Study, the proposed amendments to Rule 11-10 that would result in monitoring weekly may potentially delay the detection of a leak under specific circumstances, and subsequently delay minimization and/or repair of the leak resulting in increased ROG emissions above the currently approved Rule 11-10 (emission reductions “forgone.”). This potential delay exists relative to the Rule 11-10 as it was adopted, but not relative to Rule 11-10 as it was actually implemented. Rule 11-10 has been implemented consistent with the Valero Case Agreement, which provides for weekly monitoring. The NOP/IS (see Appendix A) determined that air quality impacts of the proposed rule amendments are potentially significant. Project-specific and cumulative adverse air quality impacts associated with the proposed rule amendments 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 Air District to ensure that state and federal ambient air quality standards (AAQS) 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 (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. The state and national NAAQS for each of these pollutants and their effects on health are summarized in Table 3.2-1.

TABLE 3.2-1

Federal and State Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	No Federal 1-hr standard 0.070 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	0.030 ppm, annual avg. 0.18 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.100 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. >	No Federal 24-hr Standard> 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 ₁₀)	20 µg/m ³ , ann. arithmetic mean > 50 µg/m ³ , 24-hr average>	No Federal annual Standard 150 µg/m ³ , 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 _{2.5})	12 µg/m ³ , annual arithmetic mean> No State 24-hr Standard	12 µg/m ³ , annual arithmetic mean> 35 µg/m ³ , 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m ³ , 24-hr avg. >=	No Federal Standard	(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 ³ , 30-day avg. >= No State Calendar Quarter Standard No State 3-Month Rolling Avg. Standard	No Federal 30-day avg. Standard 1.5 µg/m ³ , calendar quarter> 0.15 µg/m ³ 3-Month Rolling average	(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)	No Federal Standard	Visibility based standard, not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

U.S. EPA requires CARB and Air District to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the Air District monitors levels of various criteria pollutants at 25 monitoring stations within the San Francisco Bay Area. A summary of the 2017 maximum concentration and number of days exceeding state and federal ambient air standards at the Air District monitoring stations are presented in Table 3.2-2.

CHAPTER 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

TABLE 3.2-2
Bay Area Air Pollution Summary – 2017

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM ₁₀				PM _{2.5}				
	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 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr Days	Max 24-Hr	Nat 24-Hr Days	3-Yr Avg	Ann Avg	3-Yr Avg
North Counties	(ppb)						(ppm)			(ppb)				(ppb)				(µg/m ³)				(µg/m ³)				
Napa	98	1	84	2	2	63	5.6	4.7	0	53	7	0	0	-	-	-	-	-	-	-	-	199.1	13	35	13.7	10.9
San Rafael	88	0	63	0	0	58	2.6	1.6	0	53	10	0	0	-	-	-	-	17.7	94	0	2	74.7	8	27	9.7	8.2
Sebastopol	87	0	71	1	1	53	2.1	1.6	0	35	5	0	0	-	-	-	-	-	-	-	-	81.8	4	21	8.1	6.5
Vallejo	105	1	88	2	2	61	3.1	2.1	0	49	8	0	0	5.9	2.17	0	0	-	-	-	-	101.9	9	30	11.6	9.5
Coast/Central Bay																										
Berkeley Aquatic Pk*	58	0	49	0	0	*	2.2	1.7	0	123	16	1	0	-	-	-	-	-	-	-	-	52.0	7	*	9.1	*
Laney College Fwy	-	-	-	-	-	-	1.9	1.3	0	68	17	0	0	-	-	-	-	-	-	-	-	70.8	8	27	11.6	10.1
Oakland	136	2	100	2	2	54	3.2	2.2	0	65	10	0	0	-	-	-	-	-	-	-	-	70.2	7	24	9.4	7.9
Oakland-West	87	0	68	0	0	48	6.0	2.1	0	52	13	0	0	16.9	2.2	0	0	-	-	-	-	56.0	7	28	12.8	10.6
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	2.9	0	0	-	-	-	-	-	-	-	-	-
San Francisco	87	0	54	0	0	47	2.5	1.4	0	73	11	0	0	-	-	-	-	22.0	77	0	2	49.9	7	27	9.7	8.3
San Pablo	104	3	80	2	2	52	2.5	1.9	0	48	8	0	0	8.3	2.7	0	0	20.3	95	0	4	71.2	9	30	10.8	9.3
Eastern District																										
Bethel Island	90	0	71	1	2	68	1.6	1.0	0	34	5	0	0	5.3	3.5	0	0	16.3	52	0	1	-	-	-	-	-
Concord	82	0	70	0	0	66	1.7	1.3	0	41	7	0	0	13.2	2.6	0	0	13.3	41	0	0	89.4	6	26	12.0	8.9
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	23.5	5.6	0	0	-	-	-	-	-	-	-	-	-
Fairfield	80	0	62	0	0	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	109	5	86	6	6	75	-	-	-	45	9	0	0	-	-	-	-	-	-	-	-	41.5	2	25	8.5	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	15.9	3.1	0	0	-	-	-	-	-	-	-	-	-
San Ramon	92	0	75	2	2	68	-	-	-	31	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	139	2	110	3	4	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	115	2	86	2	2	56	2.8	1.4	0	67	11	0	0	-	-	-	-	-	-	-	-	60.8	6	23	9.1	7.7
Santa Clara Valley																										
Gilroy	96	1	84	1	1	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.4	2	18	75.5	6.1
Los Gatos	93	0	75	3	3	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	121	3	98	4	4	67	2.1	1.8	0	68	12	0	0	3.6	1.1	0	0	21.6	70	0	6	49.7	6	27	9.5	9.3
San Jose Freeway	-	-	-	-	-	-	2.6	1.8	0	77	17	0	0	-	-	-	-	-	-	-	-	48.4	8	28	10.8	9.5
San Martin	96	1	86	3	3	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Days over Standard		6		6	6				0			1	0			0	0			0	6		18			

Source: BAAQMD, 2018b.

*Near-road air monitoring at Berkeley Aquatic Park began on July 1, 2016. Therefore, 3-year average statistics for ozone and PM_{2.5} are not available.

(ppb) = parts per billion (ppm) = parts per million, (µg/m³) = micrograms per cubic meter

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The long-term trend of ambient concentrations of air pollutants and the number of days on which the region exceeds (AAQS) have generally declined, although some year-to-year variability primarily due to meteorology, causes some short-term increases in the number of exceedance days (see Table 3.2-3). The Air District is in attainment of the State AAQS for CO, NO₂, SO₂, lead and sulfates. However, the Air District does not comply with the State 24-hour PM₁₀ or PM_{2.5} standards. The Air District is unclassifiable/attainment for the federal CO, NO₂, SO₂, Pb, PM₁₀ and PM_{2.5} standards. A designation of unclassifiable/attainment means that EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

The 2017 air quality data from monitoring stations within the District are presented in Table 3.2-2. No monitoring stations measured an exceedance of any of the state or federal AAQS for CO and SO₂. There was one exceedance of the federal NO₂ AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM₁₀ standards. The California 24-hour PM₁₀ standard was exceeded on six days in 2017, at the San Jose monitoring station (see Table 3.2-3).

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour PM_{2.5} standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-3). The federal 24-hour PM_{2.5} standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

TABLE 3.2-3

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

YEAR	OZONE			CARBON MONOXIDE				NO _x		SULFUR DIOXIDE		PM ₁₀		PM _{2.5}
	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
2008	19	9	20	0	0	0	0	0	0	2	0	0	5	12
2009	11	11	13	0	0	0	0	0	0	0	0	0	1	11
2010	11	8	11	0	0	0	0	0	0	0	0	0	2	6
2011	9	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	8	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	9	3	10	0	0	0	0	0	0	0	0	0	2	3
2015	12	7	12	0	0	0	0	0	0	0	0	0	1	9
2016	15	6	15	0	0	0	0	0	0	0	0	0	0	0
2017	6	6	6	0	0	0	0	1	0	0	0	0	6	18

3.2.1.2 Criteria Pollutant Health Effects

3.2.1.2.1 Ozone

Ozone is not emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons, or reactive organic gases (ROG, also commonly referred to as reactive organic gases (ROG), and nitrogen oxides (NOx), in the presence of sunlight. ROG and NOx are referred to as ozone precursors.

Ozone, 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 mixing 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, ground level ozone is harmful, is a highly reactive oxidant, which accounts for its damaging effects on human health, plants and materials at the earth's surface.

Ozone is harmful to public health at high concentrations near ground level. Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat, and respiratory system and constrict the airways. Ozone also can aggravate other respiratory conditions such as asthma, bronchitis, and emphysema, causing increased hospital admissions. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation and permanently damage lung tissue. Ozone can also have negative cardiovascular impacts, including chronic hardening of the arteries and acute triggering of heart attacks. Children are most at risk as they tend to be active and outdoors in the summer when ozone levels are highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone's effects. Even healthy adults can be affected by working or exercising outdoors during high ozone levels.

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, reducing the respiratory system's ability to remove inhaled particles and fight infection while long-term exposure damages lung tissue. 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.

3.2.1.2.2 Reactive Organic Gases (ROGs)

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

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

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

3.2.1.2.3 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 used in 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.

3.2.1.2.4 Particulate Matter (PM₁₀ & PM_{2.5})

Particulate matter, or PM, consists of microscopically small solid particles or liquid droplets suspended in the air. PM can be emitted directly into the air or it can be formed from secondary reactions involving gaseous pollutants that combine in the atmosphere. Particulate pollution is primarily a problem in winter, accumulating when cold, stagnant weather comes into the Bay Area. PM is usually broken down further into two size distributions, PM₁₀ and PM_{2.5}. Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter 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 PM₁₀ and PM_{2.5}.

A consistent correlation between elevated ambient particulate matter (PM₁₀ and PM_{2.5}) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM_{2.5}) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM₁₀ and PM_{2.5}.

3.2.1.2.5 Nitrogen Dioxide (NO₂)

NO₂ is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N₂) and oxygen (O₂) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO₂. NO₂ is responsible for the brownish tinge of polluted

air. The two gases, NO and NO₂, are referred to collectively as nitrogen oxides or NO_x. In the presence of sunlight, NO₂ 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 (HNO₃) which reacts further to form nitrates, which are a component of PM₁₀.

NO₂ is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

3.2.1.2.6 Sulfur Dioxide (SO₂)

SO₂ is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H₂SO₄), which contributes to acid precipitation, and sulfates, which are a component of PM₁₀ and PM_{2.5}. Most of the SO₂ emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO₂ 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. SO₂ also causes plant damage, damage to materials, and acidification of lakes and streams.

3.2.1.3 Current Emissions Inventory

An emission inventory is a detailed estimate of air pollutant emissions from a range of sources in a given area, for a specified time period. Future projected emissions incorporate current levels of control on sources, growth in activity in the Air District and implementation of future programs that affect emissions of air pollutants.

3.2.1.3.1 Ozone

NO_x and ROG emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue to decline. ROG emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to ROG emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide ROG sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions. About 42 percent of anthropogenic ROG emissions in the Bay Area are from mobile source emissions, while 26 percent are from petroleum and solvent evaporation (see Table 3.2-4) (BAAQMD, 2017b).

TABLE 3.2-4

**Anthropogenic Air Emission Inventory 2015
(tons per day)**

Source	ROG	NOx
On-Road Motor Vehicles	59.6	128.1
Other Mobile Sources	49.2	122.2
Petroleum & Solvent Evaporation	67.3	--
Industrial and Commercial	15.4	3.0
Combustion	13.0	44.7
Other Sources	54.4	1.2

Source: BAAQMD, 2017b

Approximately 84 percent of NOx emissions in the Bay Area are produced by the combustion of fuels. Mobile sources of NOx include motor vehicles, aircraft, trains, ships, recreation boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment. NOx and ROG emissions have been reduced for both stationary and mobile sources due to more stringent regulations from CARB and the District, respectively (see Table 3.2-5) (BAAQMD, 2017b).

3.2.1.3.2 Particulate Matter

Particulate matter (both PM₁₀ and PM_{2.5}) is a diverse mixture of suspended particles and liquid droplets (aerosols). PM includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust, wood smoke, and soil. Unlike the other criteria pollutants which are individual chemical compounds, PM includes all particles that are suspended in the air. PM is both directly emitted (referred to as direct PM or primary PM) and also formed in the atmosphere through reactions among different pollutants (this is referred to as indirect or secondary PM).

PM is generally characterized on the basis of particle size. Ultra-fine PM includes particles less than 0.1 microns in diameter. Fine PM (PM_{2.5}) consists of particles 2.5 microns or less in diameter. PM₁₀ consists of particles 10 microns or less in diameter. Total suspended particulates (TSP) includes suspended particles of any size.

Combustion of fossil fuels and biomass, primarily wood, from various sources are the primary contributors of directly-emitted Bay Area PM_{2.5} (BAAQMD, 2017b). Biomass combustion concentrations are about 3-4 times higher in winter than during the other seasons, and its contribution to peak PM_{2.5} is greater. The increased winter biomass combustion sources reflect increased residential wood-burning during the winter season. The inventory of PM₁₀ and PM_{2.5} emission sources is provided in Table 3.2-5.

TABLE 3.2-5

**Particulate Emissions Inventory by Source, Annual Average 2015
(tons per day)**

Source	PM ₁₀	PM _{2.5}
Residential Wood-Burning	12.0	11.8
Geological Dust	49.1	6.6
On-Road Motor Vehicles	12.0	5.6
Other Mobile Sources	5.5	5.6
Industrial Combustion	6.5	6.1
Industrial/Commercial Processes	7.6	4.7
Accidental Fires	4.4	3.8
Commercial Cooking	2.2	1.9
Animal Waste	9.8	0.9

Source: BAAQMD, 2017b

3.2.1.4 Non-Criteria Pollutants Health Effects

Although the primary mandate of the Air District is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the Air District jurisdiction, the Air District 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. 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.

- The District's Community Air Risk Evaluation (CARE) Program has been implemented to identify areas where air pollution contributes most to health impacts and where populations are most vulnerable to air pollution; to reduce the health impacts in these areas; and to engage the community and other agencies to develop additional actions to reduce local health impacts.
- 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.
- The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities was adopted November 15, 2017. This rule requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

3.2.1.4.1 TAC Health Effects

TACs can cause or contribute to a wide range of health effects. Acute (short-term) health effects may include eye and throat irritation. Chronic (long-term) exposure to TACs may cause more severe effects such as neurological damage, hormone disruption, developmental defects, and cancer. CARB has identified roughly 200 TACs, including diesel particulate matter (diesel PM) and environmental tobacco smoke.

Unlike criteria pollutants which are subject to ambient air quality standards, TACs are primarily regulated at the individual emissions source level based on risk assessment. Human outdoor exposure risk associated with an individual air toxic species is calculated as its ground-level concentration multiplied by an established unit risk factor for that air toxic species. Total risk due to TACs is the sum of the individual risks associated with each air toxic species.

Occupational health studies have shown diesel PM to be a lung carcinogen as well as a respiratory irritant. Benzene, present in gasoline vapors and also a byproduct of combustion, has been classified as a human carcinogen and is associated with leukemia. 1,3-butadiene, produced from motor vehicle exhaust and other combustion sources, has also been associated with leukemia. Reducing 1,3-butadiene also has a co-benefit in reducing the air toxic acrolein.

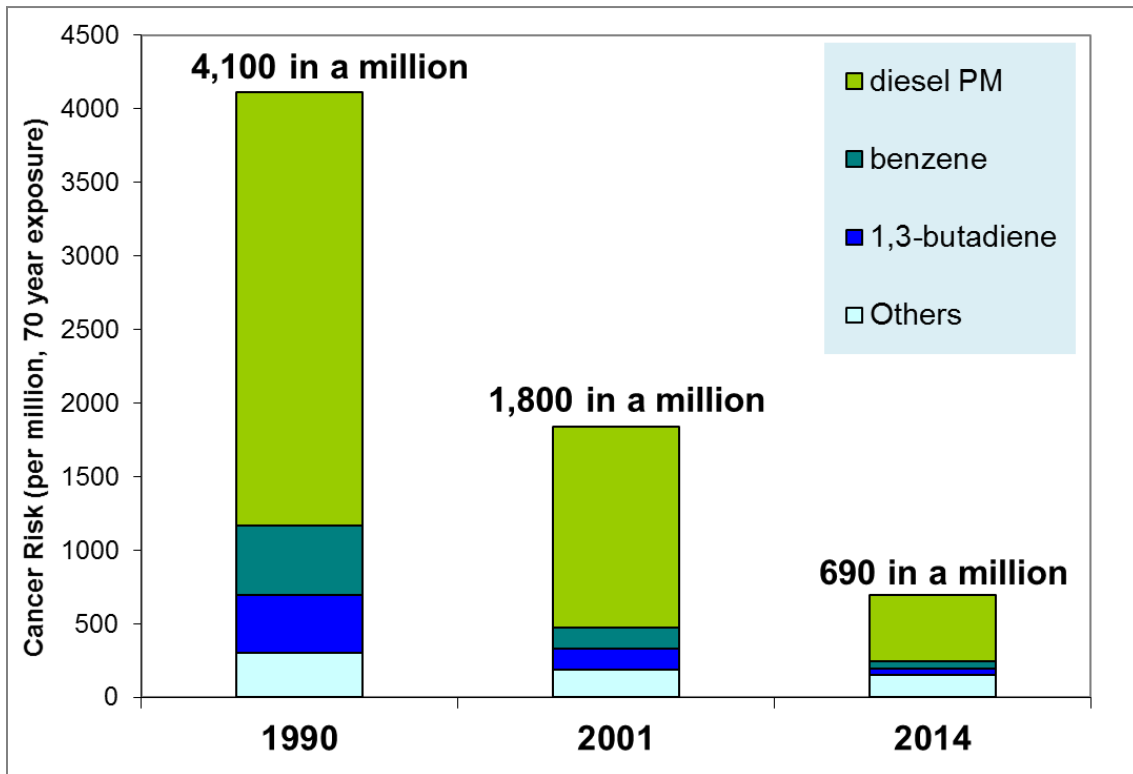
Acetaldehyde and formaldehyde are emitted from fuel combustion and other sources. They are also formed photo-chemically in the atmosphere from other compounds. Both compounds have been found to cause nasal cancers in animal studies and are also associated with skin and respiratory irritation. Human studies for carcinogenic effects of acetaldehyde are sparse but, in combination with animal studies, sufficient to support classification as a probable human carcinogen. Formaldehyde has been associated with nasal sinus cancer and nasopharyngeal cancer, and possibly with leukemia.

The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. Based on ambient air quality monitoring, and using OEHHA cancer risk factors,¹ the estimated lifetime cancer risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014, as shown in Figure 3.2-1. This represents an 80 percent decrease between 1990 and 2014 (BAAQMD, 2016).

The cancer risk related to diesel PM, which accounts for most of the cancer risk from TACs, has declined substantially over the past 15-20 years as a result of ARB regulations and Air District programs to reduce emissions from diesel engines. However, diesel PM still accounts for roughly 60 percent of the total cancer risk related to TACs.

¹ See CARB's Risk Management Guidance for Stationary Sources of Air Toxics, Discussion Draft, May 27, 2015, https://www.arb.ca.gov/toxics/rma/rma_guidancedraft052715.pdf and the Office Environmental Health Hazard Assessment's toxicity values at <http://oehha.ca.gov/media/CPFs042909.pdf>. The cancer risk estimates shown in Figure 3.2-1 are higher than the estimates provided in documents such as the Bay Area 2010 Clean Air Plan and the April 2014 CARE report entitled *Improving Air Quality and Health in Bay Area Communities*. It should be emphasized that the higher risk estimates shown in Figure 3.2-1 are due solely to changes in the methodology used to estimate cancer risk, and not to any actual increase in TAC emissions or population exposure to TACs.

FIGURE 3.2-1 Cancer-Risk Weighted Toxics Trends



Source: BAAQMD, 2016

3.2.1.4.2 Air Toxics Emission Inventory

The Air District 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 Air District, Toxic Air Contaminant Special Reports that summarizes and analyses TAC air monitoring data, facility risk assessments, health risk assessments and other relevant information.²

3.2.1.4.3 Ambient Monitoring Network

Table 3.2-6 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2015.

² See Toxic Air Contaminants Special Reports available at <http://www.baaqmd.gov/research-and-data/emission-inventory/toxic-air-contaminants>.

TABLE 3.2-6

Summary of 2017 Air District Ambient Air Toxics Monitoring Data

Compound	Max. Conc. (ppb) ⁽¹⁾	Min. Conc. (ppb) ⁽²⁾	Mean Conc. (ppb) ⁽³⁾
1,3-Butadiene	0.541	0.000	0.012
Acetaldehyde	5.680	0.480	1.982
Acetone	29.901	0.345	4.072
Acetonitrile	3.799	0.000	0.088
Acrylonitrile	0.323	0.000	0.001
Benzene	3.123	0.000	0.221
Carbon Tetrachloride	0.130	0.024	0.098
Chloroform	0.115	0.000	0.023
Dichloromethane	1.791	0.000	0.159
Ethyl Alcohol	91.740	0.236	5.455
Ethylbenzene	1.136	0.000	0.138
Ethylene Dibromide	0.000	0.000	0.000
Ethylene Dichloride	0.000	0.000	0.000
Formaldehyde	7.290	0.480	2.707
Freon-113	0.205	0.051	0.070
Methyl Chloroform	1.226	0.000	0.006
Methyl Ethyl Ketone	5.743	0.000	0.259
Tetrachloroethylene	0.337	0.000	0.003
Toluene	3.925	0.000	0.503
Trichloroethylene	0.328	0.000	0.001
Trichlorofluoromethane	0.593	0.194	0.248
Vinyl Chloride	0.000	0.000	0.000
m/p-Xylene	2.929	0.000	0.236
o-Xylene	1.446	0.000	0.108

Source: BAAQMD, 2018

NOTES: Table 3.2-6 summarizes the results of the Air District gaseous toxic air contaminant monitoring network for the year 2017. These data represent monitoring results at 21 separate sites at which samples were collected.

(1) "Maximum Conc." is the highest daily concentration measured at any of the 21 monitoring sites.

(2) "Minimum Conc." is the lowest daily concentration measured at any of the 21 monitoring sites.

(3) "Mean Conc." is the arithmetic average of the air samples collected in 2017 at the 21 monitoring sites.

(4) Acetaldehyde and formaldehyde concentrations reflect measurements from one monitoring site (San Jose-Jackson).

3.2.2 REGULATORY SETTING

3.2.2.1 Criteria Pollutants

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3.2-1. The federal, state, and local air quality regulations are identified below in further detail.

3.2.2.1.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for oxidants (ozone), CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the Air District, 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.

Other federal regulations applicable to the Bay Area include Title III of the Clean Air Act, which regulates toxic air contaminants. Title V of the Act establishes a federal permit program for large stationary emission sources. The U.S. EPA also has authority over the Prevention of Significant Deterioration (PSD) program, as well as the New Source Performance Standards (NSPS), both of which regulate stationary sources under specified conditions.

3.2.2.1.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the

federal government has established National Ambient Air Quality Standards and also has standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Federal and state air quality standards are presented in Table 3.2-1 under Air Quality Environmental Setting. California standards are generally more stringent than the National Ambient Air Quality Standards. CARB has established emission standards for vehicles sold in California and for various types of combustion equipment. CARB also sets fuel specifications to reduce vehicular emissions.

CARB released the Proposed 2016 State Strategy for the State Implementation Strategy on May 17, 2016. The measures contained in the State SIP Strategy reflect a combination of state actions, petitions for federal action, and actions for deployment of cleaner technologies in all sectors. CARB's proposed state SIP Strategy includes control measures for on-road vehicles, locomotives, ocean going vessels, and off-road equipment that are aimed at helping all districts in California to comply with federal and state ambient air quality standards.

California gasoline specifications are governed by both state and federal agencies. During the past two decades, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations in 1999, which required, among other things, that California phase out the use of MTBE in gasoline. The CARB Reformulated Gasoline Phase III regulations have been amended several times (the most recent amendments were adopted in 2013) since the original adoption by CARB.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

3.2.2.1.3 Air District Regulations

The California Legislature created the Air District in 1955. The Air District is responsible for regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The District is governed by a 24-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 District is responsible for implementing emissions standards and other requirements of federal and state laws. Numerous regulations have been developed by the District to control emissions sources within its jurisdiction. It is also responsible for developing air quality planning documents required by both federal and state laws.

Bay Area facilities 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 ROG emissions);
- Requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95 percent control of ROG 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 ROG for equipment leaks, unless those leaks are repaired within a specific timeframe; 250 ppm by volume SO₂ in exhaust gases from sulfur recovery units; 1,000 ppm by volume SO₂ 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_x 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 (H₂S) 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).
- Requiring that emissions of non-methane organic compounds and methane from the waste decomposition process at solid waste disposal sites be limited.
- Requiring emission limits on ozone precursor organic compounds from valves and flanges.
- Requiring the limitation of emissions of organic compounds from gasoline dispensing facilities.

3.2.2.2 Toxic Air Contaminants

3.2.2.2.1 Federal and State Regulations

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

Title III of the 1990 CAA amendments required the U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by the U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for affected 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 promulgated by May 2015.

Many sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed four 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), as amended by Senate Bill (SB) 1731, 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. AB2588 requires operators of certain stationary sources to inventory air toxic emissions from their operation and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be “significant” (greater than 10 per million exposures or non-cancer chronic or acute hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affect individuals.

Community Air Protection Program (AB617): The Community Air Protection Program was established under AB617 to reduce exposure in communities most impacted by air pollution. The Program includes community air monitoring and community emissions reduction programs, as well as funding to support early actions to address localized air pollution through targeted incentive funding to deploy cleaner technologies in these impacted communities. AB617 also includes new requirements for accelerated retrofit of pollution controls on industrial sources, increased penalty fees, and greater transparency and availability of air quality and emissions data, which will help advance air pollution control efforts. CARB is required to select the communities for action in the first year of the program and develop the program requirements by October 2018.

3.2.2.2.2 District TAC Rules and Regulations

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. 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.

District Rules and Regulations: The Air District has a number of rules that reduce or control emissions from stationary sources. A number of regulations that control criteria pollutant emissions also control TAC emissions. For example, inspection and maintenance programs for fugitive emission sources (e.g., pumps, valves, and flanges) control ROG emissions, some of which may also be TAC emissions. As discussed above, the District's Rule 11-18: Reduction from Air Toxic Emissions at Existing Facilities requires a review of TAC emissions, health risk assessments for facilities that have priority scores above a certain level, and risk reduction measures or installation of Best Available Retrofit Control Technology for toxics on all significant sources of toxic emissions, if certain health risks are exceeded.

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.

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 prioritization scores remain above the thresholds, the Air District will require that the facility perform a comprehensive site-wide HRA.

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 3.2-7 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 3.2-7

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

Targeted Control of TACs Under the Community Air Risk Evaluation Program: In 2004, the Air District established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, the Air District 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.

The CARE program was initiated to evaluate and reduce health risks associated with exposures to outdoor TACs and other pollutants in the Bay Area. The program examines emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The main objectives of the program are to:

- Characterize and evaluate potential cancer and non-cancer health risks associated with exposure to TACs and other pollutants from both stationary and mobile sources throughout the Bay Area.
- Assess potential exposures to sensitive populations including children, senior citizens, and people with respiratory illnesses.
- Identify significant sources of emissions and prioritize use of resources to reduce exposure in the most highly impacts areas (i.e., priority communities).
- Develop and implement mitigation measures such as grants, guidelines or regulations, to achieve cleaner air for the public and the environment, focusing initially on priority communities.

The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the

technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations.

The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities: Rule 11-18, adopted November 15, 2017, requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

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 6, Rule 2: Miscellaneous Operations
- 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 7: Gasoline Dispensing Facilities
- 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 22: Valves and Flanges at Chemical Plants
- Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Air District Regulation 8, Rule 33: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- Air District Regulation 8, Rule 39: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- 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 7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

- 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 9, Rule 11: Nitrogen Oxides And Carbon Monoxide from Utility Electric Power Generating Boilers
- Air District Regulation 11, Rule 1: Lead
- Air District Regulation 11, Rule 8: Hexavalent Chromium
- Air District Regulation 11, Rule 18: Risk Reduction from Air Toxic Emissions at Existing Facilities
- 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 SIGNIFICANCE CRITERIA

On June 2, 2010, the District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These CEQA thresholds were designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA. The CEQA thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the Thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards.

In view of the Supreme Court's opinion, local agencies may rely on the District's CEQA thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the CEQA thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts.

The Air District published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The CEQA Guidelines for

implementation of the Thresholds are for information purposes only to assist local agencies. Recommendations in the Guidelines are advisory and should be followed by local governments at their own discretion. The Air District is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance. Since these are the most current air quality significance thresholds and address court decisions, they will be used in the CEQA air quality analysis for the current project.

Construction Emissions

Regarding construction emissions, the Air District’s 2017 Thresholds of Significance will be used in the current air quality analysis for construction emissions (see Table 3.2-8).

TABLE 3.2-8

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NOx	54
PM ₁₀	82*
PM _{2.5}	54*
PM ₁₀ / PM _{2.5} Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.
Source: BAAQMD, 2017a

Operational Emissions

The most recently available CEQA Guidelines established emission thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of “no net increase in emissions” is appropriate for Air Quality Plans because they include a mix of control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular individual rule development effort, there may not be opportunities to make these trade-offs.

The 2017 project-level stationary source CEQA thresholds are identified in Table 3.2-9. These represent the levels at which a project’s individual emissions would result in a cumulatively considerable contribution to the Air District’s existing air quality conditions

for individual projects. These thresholds are based on the federal offset requirements for ozone precursors for which the Bay Area is designated as a non-attainment area, which is an appropriate approach to prevent further deterioration of ambient air quality and thus has nexus and proportionality to prevent regionally cumulative significant impacts (e.g., worsened status of non-attainment). Despite being a non-attainment area for state PM₁₀ and pending nonattainment for federal PM_{2.5}, the federal NSR significant emission rate annual limits of 15 and 10 tons per year, respectively, are the thresholds as the District has not established an offset requirement limit for PM_{2.5} and the existing limit of 100 tons per year is much less stringent and would not be appropriate in light of the pending non-attainment designation for the federal 24-hour PM_{2.5} standards. These operational thresholds represent the emission levels above which a project’s individual emissions would result in a cumulatively considerable contribution to the Bay Area’s existing air quality conditions. The Air District is planning to develop significance thresholds specifically for rules. Until that effort is complete and in order to provide a conservative air quality analysis, the project-specific thresholds recommended in the revised 2017 CEQA Guidelines (BAAQMD, 2017a) will be used in the current air quality impacts analysis (see Table 3.2-9).

TABLE 3.2-9

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NO _x	54	10
PM ₁₀	82	15
PM _{2.5}	54	10

Source: BAAQMD, 2017a

3.2.4 ENVIRONMENTAL IMPACTS

As discussed in Chapter 2, the proposed amendments to Rule 6-5 clarifies that Rule 6-5 does not apply to existing FCCUs that have wet scrubbers and deletes placeholders in the existing rule for future limits on condensable matter and sulfur dioxide. The amendments to Rule 6-5 providing clarifications to the existing rule, would not require any physical changes to the existing refinery FCCUs, and would not require the construction and operation of any new equipment. Therefore, the proposed amendments to Rule 6-5 would have no impact on air quality.

The proposed amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan

requirements, procedures for updating the guidelines, crude slate reporting requirements, and confidential information designation procedures. Rule 12-15 is an emissions reporting rule, so no refinery modifications are required, no emission control is required, no physical impacts to the refineries would occur, and no air emissions changes (increases or decreases) would occur, if implemented.

Amendments to Rule 11-10 were passed by the District in December 2015 (2015 Rule 11-10 Amendments), which required daily or continuous monitoring requirements for cooling towers larger than 2,500 gpm. The currently proposed amendments would require cooling towers in petroleum refining service to be sampled once per week instead of once per day. The amendments to Rule 11-10 would not require the construction of any new equipment or modifications to the existing refineries but would modify the monitoring requirements.

3.2.4.1 Potential Criteria Pollutant Impacts During Construction

As discussed above, the proposed amendments to Rules 6-5, 12-15, and 11-10 would not require the construction of any new equipment or require modifications to existing refinery equipment. Therefore, the proposed rule amendments would not result in any emissions associated with construction activities.

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

The proposed projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require any physical modifications or the construction of any additional air pollution control equipment or refinery modifications. Changing monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. However, changing monitoring requirements for cooling towers as proposed in the amendments to Rule 11-10 may impact emissions relative to the Rule 11-10 as adopted in December 2015 due to reduced frequency in monitoring and potential leak detection.

The goal of implementing Rule 11-10 was to achieve technically feasible ROG and TAC emission reductions from cooling towers at Bay Area refineries by requiring more rapid detection of heat exchanger leaks. The Bay Area has five large-scale petroleum refineries which operate a total of 34 cooling towers. These cooling towers are large, industrial heat exchangers that are used to dissipate significant heat loads to the atmosphere through the evaporation of water. When heat exchanger leaks go undetected for long periods of time, significant quantities of organic compounds (both ROG and TAC emissions) can be stripped from the cooling tower water and emitted to the atmosphere.

Proposed amendments to Rule 11-10 have been developed to codify how Rule 11-10 has actually been implemented under the terms of the Valero Case Agreement. The proposed amendments to Rule 11-10 require weekly monitoring, with potential adjustments to twice-

monthly monitoring (i.e. two samples per month). These proposed amendments are estimated to reduce ROG emissions to as low as 64 tpy. While less stringent than daily monitoring, weekly monitoring remains substantially more stringent than monthly monitoring. Changing monitoring frequency as proposed in amendments to Rule 11-10 does not result in an increase in actual emissions because the amendments are consistent with how the Rule has been implemented since adoption. However, the change in monitoring frequency, when compared to the rule language as adopted, can theoretically allow for an emissions impact since less frequent monitoring may allow a potential future leak to go undetected for a longer period of time.

The Air District's position is that a theoretical impact of increased emissions relative to the rule language that was never implemented does not require analysis under CEQA. However, for the sake of transparency and thoroughness, the Air District is analyzing these theoretical impacts so that the public understands the difference between the rule as it was adopted (though not implemented) and the rule as proposed. Staff estimates the foregone emissions reductions that could theoretically occur when monitoring weekly rather than daily range from 1 tpy to 16 tpy depending on the method used to estimate emission factors for each monitoring frequency.

Approval of Rule 11-10 in December 2015 required daily monitoring of cooling towers for leaks, while the currently proposed amendments to Rule 11-10 would require weekly monitoring with potential adjustments to twice-monthly monitoring. Approval of Rule 11-10 would have resulted in emission reductions, if implemented. These potential emission reductions have been estimated using three different methodologies based on data developed by the U.S. EPA during development of the MACT standard for cooling towers:

- Method 1: Used the “no monitoring” emissions factor (6.0 lb ROG/million gallons of cooling tower recirculating water) and “monthly monitoring” emission factor (0.7 lb ROG/million gallons) to back calculate the likely leak magnitude and frequency of a “typical” cooling tower.
- Method 2: Extrapolate directly (linear extrapolation) from the “no monitoring” emission factor through “monthly monitoring” emission factor to derive emissions factors for twice monthly, weekly, and daily monitoring.
- Method 3: Extrapolate directly (linear extrapolation) from the emission factors for annual, quarterly, and monthly monitoring periods. The staff report supporting the MACT development from RTI International to U.S. EPA provided leak rate and emission reduction estimates for annual, quarterly, and monthly monitoring periods. This information provided the basis for extrapolating the estimated emission factors for twice monthly, weekly, and daily monitoring.³

Approval of Rule 11-10 in December 2015 was based on estimated reduction of ROG emissions from 978 tons per year to 117 tons per year (a reduction in 861 tons per year:

³ The details of the emission calculations are provided in the District Staff Report, Refinery Rules, Proposed Rule Amendments to Rules 6-5, 11-10, and 12-15, October 2018.

978 – 117 = 861) (see Table 3.2-10). The estimate was based on the U.S. EPA AP-42 emissions factors of 6.0 lbs ROG per million gallons on cooling water circulation for unmonitored cooling towers, and 0.7 lbs per million gallons of cooling water circulation for cooling towers that are monitored monthly (see Table 3.2-10).

The daily or continuous monitoring requirements for cooling towers larger than 2,500 gpm (Rule 11-10 as adopted) are more stringent than monthly monitoring. Using Method 1, the daily or continuous monitoring requirements for cooling towers larger than 2,500 gpm (Rule 11-10 as adopted) was expected to reduce ROG emissions to 48 tons per year assuming one leak per cooling tower per year (with an emission factor of 0.255 lbs ROG per million gallons of cooling water circulation, assuming leaks are detected within one day and are repaired on average within a 14 day repair period) (see Table 3.2-10). Methods 2 and 3 for weekly and daily monitoring, resulting in estimates of ROG emissions to be 76 tons per year and 90 tons per year, respectively.

TABLE 3.2-10

ROG Emission Changes Associated with Amendments to Rule 11-10

Refinery	2015 Emissions (Baseline)	Rule 11-10 Estimated Reductions	Emission Reductions under Rule 11-10 as adopted Tons/yr			Emission Reductions Proposed Amendments to Rule 11-10 Tons/yr		
	Tons/yr	Tons/yr	Method 1	Method 2	Method 3	Method 1	Method 2	Method 3
1	278.78	33.33	14.34	21.65	25.99	18.99	23.36	25.93
2	257.83	30.83	10.92	20.03	23.72	14.51	21.61	23.98
3	84.41	10.09	3.57	6.56	7.76	4.68	7.07	7.85
4	354.34	42.37	15.09	27.52	32.59	20.13	29.70	32.95
5	3.11	0.37	4.03	0.24	0.28	5.35	0.26	0.29
Totals:	978.47	117	48	76	90	64	82	91
Emission Reductions	--	861	930	902	888	914	896	887
Potential Emission Reductions Forgone						16 (930-914)	6 (902-896)	1 (888-887)

While less stringent than daily monitoring, weekly monitoring remains substantially more stringent than monthly monitoring. The draft amendments to Rule 11-10 (weekly monitoring for cooling towers larger than 2,500 gpm) are estimated to result in emissions from heat exchanger leaks at a range of 64 to 91 tons per year, depending on the calculation method used (see Table 3.2-10). The range of higher emission factors is estimated based on the fact that less frequent monitoring means that it could take longer to find and repair the leak. The proposed amendments to Rule 11-10 that would result in weekly monitoring

may, relative to the rule as written, potentially delay the detection of a leak under specific circumstances, and subsequently delay minimization and/or repair of a leak resulting in increased ROG emissions above the currently approved Rule 11-10 (referred to as emission reductions “forgone” because these emission reductions have not been achieved). The potential ROG emissions forgone have been estimated to range from 1 to 16 tons per year (see Table 3.2-10).

Based on the above analysis, the greatest impact would be that potential ROG emission reductions foregone would exceed the significance threshold of 10 tons per year. Since the operational ROG emissions could exceed the significance threshold, ROG emissions are an ozone precursor, and the district is not in attainment for ozone; the proposed amendments to Rule 11-10 may contribute to an existing or projected air quality violation. The proposed amendments to Rule 11-10 would result in ROG emission reductions foregone (not achieved) from the existing Rule 11-10 that exceed the operational ROG significance threshold of 10 tons per year.

3.2.4.3 Potential Toxic Air Contaminant Impacts

The goal of implementing Rule 11-10 was to achieve technically feasible ROG and TAC emission reductions from cooling towers at Bay Area refineries by requiring more rapid detection of heat exchanger leaks. When heat exchanger leaks go undetected for long periods of time, organic compounds (both ROG and TAC emissions) can be stripped from the cooling tower water and emitted to the atmosphere.

As discussed in Section 3.2.4.2, approval of Rule 11-10 in December 2015 required daily monitoring of cooling towers for leaks, while the currently proposed amendments to Rule 11-10 would require weekly monitoring with potential adjustments to bi-monthly monitoring. Approval of Rule 11-10 in December 2015 was based on estimated reduction of hydrocarbon emissions from 978 tons per year to 117 tons per year, a reduction in 861 tons per year. The daily or continuous monitoring requirements for cooling towers larger than 2,500 gpm (Rule 11-10 as adopted) are more stringent than monthly monitoring. While less stringent than daily monitoring, weekly monitoring remains substantially more stringent than monthly monitoring.

The proposed amendments to Rule 11-10 that would result in monitoring weekly may potentially delay, relative to the rule as written, the detection of a leak under specific circumstances, and subsequently delay minimization and/or repair of a leak resulting in increased ROG and TAC emissions above the currently approved Rule 11-10 (emission reductions “forgone.”). The potential emissions forgone have been estimated to range from approximately 1 to 16 tons per year and could exceed the ROG significance criteria.

A portion of the ROG emissions associated with leaks into the cooling towers may also be TAC emissions. OEHHA has compiled a comprehensive list of 188 chemicals that have been reported to be emitted from California refineries. The ten highest routine emissions from California refineries include ammonia, formaldehyde, methanol, sulfuric acid, hydrogen sulfide, toluene, xylenes, benzene, hexane, and hydrogen chloride. The refinery

processes and equipment associated with the most chemical emissions were product loading, fluid catalytic cracking units (FCCUs), heaters, cokers, and vents. The chemicals released in the majority of the processes were phenol, naphthalene, benzene, and toluene (OEHHA, 2017).

OEHHA also calculated the toxicity-weighted score for refinery emissions using the emissions data (pounds emitted per year) and a toxicity weight derived from the U.S. EPA's Inhalation Toxicity Scores for individual chemicals. The chemicals emitted from refineries in California with the highest calculated toxicity-weighted emissions are: formaldehyde, nickel, arsenic, cadmium, benzene, polycyclic aromatic hydrocarbons, hexavalent chromium, benzo(a)pyrene, phenanthrene, beryllium, ammonia, 1,3-butadiene, naphthalene, hydrogen sulfide, acetaldehyde, manganese, and diethanolamine. Gases make up the majority of the routine refinery TAC emissions (OEHHA, 2017).

Heat exchanger leaks can occur from any refinery unit and could include any type of organic compound present at refineries, including those TACs that are commonly emitted from refineries. The potential ROG emissions forgone associated with the proposed amendments to Rule 11-10 are estimated to be as much as 16 tons per year, some of which would likely be TAC emissions. However, the unit that may leak, location of the leak, the sources of the leak, and the type of material/product that may leak is unknown and cannot be estimated or predicted with any certainty. The TAC emissions from a cooling tower would be dependent on the units being cooled by a given cooling tower and, therefore, the TAC emission factors are unit-specific. The U.S. EPA's AP-42 does not provide any generic TAC emission factors for cooling towers. The type of TACs emitted and the quantity emitted are also unknown and the potential impacts from TAC emissions foregone are considered to be speculative and not a reasonably foreseeable impact (CEQA Guidelines §15064(d)(3)). CEQA Guidelines §15145 states: "If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusions and terminate discussion of the impact." Therefore, no further evaluation of TAC impacts will be provided as the potential TAC emission impacts are considered speculative.

3.2.5 MITIGATION MEASURES

Since the proposed amendments to Rule 11-10 would result in ROG emission reductions foregone from the existing Rule 11-10 that can exceed the operational ROG significance threshold of 10 tons per year, feasible mitigation measures are required to be evaluated to reduce the potential ROG impacts.

There is no feasible control equipment that could be used to remove the generally low concentrations of ROG that may be present in cooling tower water. The concentration of ROG as compared to the volume of water makes air pollution control equipment such as air strippers or carbon adsorption technologically and economically not feasible.

The only method to reduce ROG emissions from cooling towers is more frequent monitoring and repair. The District has reviewed the costs and requirements associated

with daily or continuous monitoring with the affected refineries since the approval of the Rule 11-10 in December 2015. The use of continuous monitors has a number of limitations at this time, which include the sensitivity of the analysis (detection limits are not low enough) and the reliability of the monitors (frequent downtime) so continuous monitors are not considered to be feasible at this time.

The costs effectiveness associated with implementation of daily cooling tower monitoring as Rule 11-10 was currently adopted compared to weekly cooling tower monitoring was determined to be over \$100,000 per ton of ROG emissions controlled, which exceeds the cost effectiveness determinations generally used by the District, which are more in the range of \$25,000 to \$35,000 per ton of emissions controlled. Therefore, the “no project” alternative of daily monitoring to further control emissions from cooling towers is not considered to be feasible at this time.

Per CEQA Guidelines §15364, “feasible” “means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” Therefore, additional air pollution control equipment and continuous monitors are not feasible based on technological factors. Monitoring on a daily basis is not feasible because it is not cost effective. Based on the above, no feasible mitigation measures have been identified that could avoid the significant impact (increase in ROG emissions foregone) or reduce the impact to less than significant.

It is concluded that the proposed project has the potential to generate significant adverse air quality impacts for operation. As a result, a Statement of Findings and Statement of Overriding Considerations will be prepared for the Board’s consideration and approval.

3.2.6 CUMULATIVE 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 amendments to Rules 6-5, 11-10 and 12-15, related projects would consist of other past, present, and probable future District rules and regulations, as well as implementing control measures in the 2017 Clean Air Plan.

3.2.6.1 Criteria Air Pollutants

The proposed amendments to Rules 6-5, 11-10 and 12-15 would not result in any construction activities and would not generate any construction - related air emissions. Therefore, construction emissions are not considered to be cumulatively considerable and would not generate any significant adverse impacts.

The preceding analysis concluded that air quality impacts from operational activities associated with the proposed modifications to Rule 11-10 could result in as much as 16 tons per year of ROG emissions foregone, which exceeds the 10 ton per year ROG significance threshold and, therefore, are potentially significant. As a result, air quality impacts from Rule 11-10 are considered to be cumulatively considerable, pursuant to CEQA Guidelines §15064 (h)(1), since the district is not in attainment of the ozone ambient air quality standards and ROG is an ozone precursor.

As described in the EIR for the Clean Air Plan (BAAQMD, 2017b), air quality within the Bay Area has improved since 1955 when the Air District was created and is projected to continue to improve. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by the Air District. This trend towards cleaner air has occurred in spite of continued population growth. The Air District is in attainment of the State and federal ambient air quality standards for CO, NO_x, and SO₂.

However, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 6 days in 2017 in the Air District, most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and Santa Clara Valley (see Table 3.2-2). The federal 8-hour standard was also exceeded on 6 days in 2017. The Air District is unclassified for the federal 24-hour PM₁₀ standard and is non-attainment with the State 24-hour PM₁₀ standard. Since the District is

not in attainment for the federal and state ozone standard, the state 24-hour PM₁₀ standard, and the federal 24-hour PM_{2.5} standard, past projects and activities have contributed to the nonattainment air quality impacts that are cumulatively significant.

The 2017 Clean Air Plan contains numerous control measures that the District intends to impose to improve overall air quality in the District. Control measures in the 2017 Clean Air Plan (BAAQMD, 2017b) included:

- Control Measure SS1 – Fluid Catalytic Cracking in Refineries, which included the currently proposed amendments to Rule 6-5.
- Control Measure SS3 – Cooling Towers, which included the 2015 amendments to Rule 11-10. Therefore, Control Measure SS3 will not be implemented as proposed in the 2017 CAP.
- Control Measure SS10 – Petroleum Refining Emissions Tracking, which included the currently proposed Rule 12-15.

The 2017 Clean Air Plan is expected to result in overall reductions in VOC, NO_x, SO_x, and PM emissions, providing an air quality benefit (BAAQMD, 2017b). As reported in the Final EIR for the 2017 Air Plan, large emission reductions are expected from implementation of the 2017 Plan including reductions in ROG emissions of 1,596 tons/year; NO_x emissions of 2,929 tons/year, SO_x emissions of 2,590 tons/year, and PM_{2.5} emissions of 503 tons/year (see Table 3.2-21 of the Final EIR, BAAQMD 2017b). These emission reductions are expected to help the Bay Area come into compliance or attainment with the federal and state 8-hour ozone standard, the federal and state PM₁₀ standards, the federal 24-hour PM_{2.5} standards, and the state 24-hour PM_{2.5} standard, providing both air quality and public health benefits. The proposed amendments to Rule 11-10 are expected to result in a cumulatively considerable contribution to the existing air quality. However, the ROG emission reductions from the 2017 Plan (1,596 tons per year) are expected to far outweigh the potential ROG emission increases (16 tons per year) associated with the proposed amendments to Rule 11-10, providing an overall beneficial impact on air quality and public health.

CHAPTER 3.3

OTHER CEQA SECTIONS

Growth Inducing Impacts
Significant Environmental Effects Which Cannot be Avoided and
Significant Irreversible Environmental Changes
Potential Environmental Impacts Found Not to be Significant

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3.3 OTHER CEQA SECTIONS

3.3.1 GROWTH INDUCING IMPACTS

3.3.1.1 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.

3.3.1.2 Economic and Population Growth, and Related Public Services

The proposed rule amendments would not directly foster economic or population growth or the construction of new housing in the Bay area. The proposed rule amendments will not require construction or the addition of new workers; 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 rule amendments would not remove barriers to population growth, as it involves no changes to General Plans, zoning ordinance, or related land use policies. The proposed rule amendments do not include the development of new housing or population-generating uses or infrastructure that would directly encourage such uses. The proposed rule amendments are limited to existing refineries. Therefore,

the Refinery Rule Amendments would not directly or indirectly trigger new residential development in the District.

Further, the proposed rule amendments 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 rule would not result in an increase in workers or residents. Likewise, the proposed rule 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 rule amendments would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

3.3.1.3 Removal of Obstacles to Growth

The proposed rule amendments 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, such as wastewater treatment facilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed rule amendments 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.

3.3.1.4 Development of Encroachment 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 rule amendments would only apply to existing refineries and no physical modifications are required. New development outside of the boundaries of industrial facilities is not expected to occur. Therefore, the proposed rule amendments would not result in development within or encroachment into an open space area.

3.3.1.5 Precedent Setting Action

The Refinery Rule Amendments would lead to changes in reporting and monitoring requirements. Similar types of activities are currently required of refineries and other industrial facilities to comply with various regulatory requirements. Similar requirements already exist and making minor changes to these existing requirements would not result in precedent-setting actions that might cause significant environmental impacts.

3.3.1.6 Conclusion

The proposed rule amendments 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.

3.3.2 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 rule amendments would result in potentially significant unavoidable air quality impacts due to the potential ROG emissions reductions “foregone.”

3.3.3 POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the Refinery Rule Amendments that may have potentially significant adverse effects on the environment are identified, evaluated, 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 (§§15126(a) and 15126.2). The potentially significant adverse environmental impacts as determined by the Initial Study (see Appendix A) are limited to air quality impacts. The analysis provided in the Initial Study has concluded that the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources; biological resources; cultural resources; geology and soils; greenhouse gas emissions; hazards and hazardous materials; hydrology and water quality; land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation and traffic; tribal cultural resources; and utilities and service systems. The reasons for finding the environmental resources to be less than significant are explained in the following subsections.

3.3.3.1 Aesthetics

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. None of the proposed rule amendments are expected to result in visual changes to the refineries. Therefore, obstruction of scenic resources or degrading the visual character of a site, including but not limited to: trees, rock outcroppings, or historic buildings, is not expected.

Additionally, the proposed rule amendments are not expected to require any new equipment or any new light generating equipment for compliance. The existing refineries are current lighted for nighttime work and operate 24 hours per day, and no additional light or glare would be added to impact day or nighttime views in the Bay Area.

3.3.3.2 Agriculture and Forestry Resources

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

The proposed rule amendments would affect petroleum refineries that are located within industrial areas and no agricultural or forest resources are located within refineries. The proposed project would not conflict with existing agriculture related zoning designations or Williamson Act contracts. Williamson Act lands within the boundaries of the District would not be affected. No effects on agricultural or forestland resources are expected because the proposed project would not require any new development. All of the activities associated with the proposed rule amendments would occur within the confines of the existing refineries. Therefore, there is no potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract or impacts to forestland resources.

3.3.3.3 Biological Resources

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

Vegetation has been removed from the operating portions of refineries to minimize the potential for fire hazards. Since the proposed amendments to Rules 6-5, 11-10, and 12-15 are not expected to result in physical modifications to the existing refineries, they are not expected to result in impacts to biological resources and would not directly or indirectly affect riparian habitat, federally protected wetlands, or migratory corridors.

The proposed rule amendments would not conflict with local policies or ordinances protecting biological resources, nor would they conflict with local, regional, or state conservation plans because as the proposed project applies to equipment in existing developed refineries. The proposed project will also not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan as these types of conservation plans are not located within existing refineries.

3.3.3.4 Cultural Resources

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

Refinery structures are typically not considered to be historic resources. Therefore, no impacts to historical resources are expected as a result of the proposed project, since no structures would be required to be removed. No construction activities are expected to be required as part of the proposed project; therefore, no impacts to cultural resources, including archaeological resources, paleontological resources, or disturbance of human remains would occur as a result of the proposed project.

3.3.3.5 Geology and Soils

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.

No significant impacts from seismic hazards are expected since no new equipment or structures would be required to comply with the proposed rule amendments. Thus, exposure of people or structures to the risk of loss, injury, or death involving seismic-related activities is not anticipated as a result of compliance with the proposed rule amendments. Therefore, no significant adverse impacts on geology and soils are expected. Additionally, the proposed amendments would not result in additional grading or other construction activities that could result in soil erosion or the loss of topsoil. Further, no construction activities would be required so no additional landslide, lateral spreading, subsidence, liquefaction or collapse impacts or development on expansive soils would occur due to the proposed rule amendments.

The proposed rule amendments would have no effect on the installation of septic tanks or alternative wastewater disposal systems. Refineries operate existing wastewater treatment systems and the proposed rule amendments would result in no impacts to their existing wastewater treatment systems or require alternative wastewater treatment systems. Consequently, no impacts from failures of septic systems related to soils incapable of supporting such systems are anticipated.

3.3.3.6 Greenhouse Gas Emissions

Combustion of conventional hydrocarbon fuel results in the release of energy as bonds between carbon and hydrogen are broken and reformed with oxygen to create water vapor and carbon dioxide (CO₂). CO₂ is not a pollutant that occurs in relatively low concentrations as a by-product of the combustion process; CO₂ is a necessary combustion product of any fuel containing carbon. Therefore, attempts to reduce emissions of greenhouse gases from combustion focus on increasing energy efficiency – consuming less fuel to provide the same useful energy output.

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction, require additional energy or fuel, or generate GHG emissions.

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. All refineries in the Bay Area 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 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. Therefore, the refineries are subject to a plan to reduce GHG emissions. The proposed rule amendments would not require any additional equipment, construction, fuel or energy use; therefore, they would not result in any increase in GHG emissions.

3.3.3.7 Hazards and Hazardous Materials

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 potential events: (1) toxic gas clouds; (2) torch fires, flash fires, pool fires, and vapor cloud explosions; (3) thermal radiation; and (4) explosion/overpressure. The potential for these types of events to occur currently exists at existing refineries.

The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring requirements (Rule 11-10), and clarify reporting requirements (Rule 12-15). The proposed rule amendments would not require any new construction or development. Physical

modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. Ammonia is currently used to reduce NOx emissions at existing refineries. Rule 6-5 limited ammonia emissions from FCCUs. To comply, refineries were required to optimize the injection of ammonia or urea. Rule 6-5 did not increase the use of ammonia or urea and likely resulted in a decrease in ammonia use. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications.

Changing monitoring requirements from daily to weekly (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction, require the use of additional hazardous materials, generate additional hazardous materials or create new refinery hazards. Therefore, no increased hazards are expected from implementation of the proposed rule amendments.

The proposed rule amendments would not generate hazardous emissions, handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. Rule 6-5 limited ammonia emissions from FCCUs and resulted in a decrease in ammonia emissions. (Note that ammonia is regulated as a TAC). Proposed amendments to Rule 12-15 are not expected to result in an increase in TAC emissions from refineries. Note that Section 3.2.4.2 of this EIR determined that TAC emission impacts associated with the proposed amendments to Rule 11-10 were determined to be speculative per CEQA Guidelines §15064(d)(3).” Therefore, no increase in TAC emissions is expected from implementation of the proposed rule amendments and thus no increase in hazards and hazardous materials impacts is expected.

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. Implementation of the proposed rule amendments would not interfere with site cleanup activities or create additional site contamination. As a result, the proposed project is not expected to require any physical modifications to facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.

The proposed rule amendments would not 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 rule amendments which would apply to petroleum refineries operating in the Bay Area, which are not located near public airports or air strips. No construction activities or additional refinery structures are required due to the proposed rule amendments. Therefore, no significant adverse impacts on an airport land use plan or on a private air strip are expected.

No impacts on emergency response plans are anticipated from the proposed new and amended rules that would apply to existing petroleum refineries. The refineries affected by the proposed

rule amendments already exist and operate within the confines of existing industrial facilities. The proposed rule amendments do not require construction activities or new structures that would impact any emergency response plan. The existing refineries affected by the proposed rule amendments already use, produce, store and transport hazards materials, so emergency response plans already include hazards associated with existing refinery operations. The proposed rule amendments would not require any changes in emergency response planning. Therefore, no significant adverse impacts on emergency response plans are expected.

No increase in hazards associated with wildfires is anticipated from proposed rule amendments. The petroleum refineries affected by the proposed rule amendments already exist and operate within the confines of existing industrial areas. Native vegetation has been removed from the operating portions of the affected refineries to minimize fire hazards. The proposed rule amendments would not increase the risk of hazards associated with wildland fires in general and specifically in areas with flammable materials. Therefore, the proposed project would not expose people or structures to significant risk of loss, injury or death involving wildland fires.

3.3.3.8 Hydrology and Water Quality

No increase in wastewater discharge is expected from the proposed project so no impacts on water quality resources are anticipated from the proposed project. The proposed project is not expected to require any new construction or development. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed rule amendments would not require any new construction or development. Changing monitoring requirements from daily to weekly (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, require the use of additional water or result in additional wastewater discharges from the affected refineries. Therefore, the proposed rule amendments would not result in the violation of any water quality standards or waste discharge requirements, nor would it deplete groundwater supplies or interfere with groundwater recharge.

The proposed project does not have the potential to increase the area subject to runoff since no construction activities, new development or new structures are expected to occur. In addition, storm water drainage within refineries has been controlled and no construction activities are expected, therefore, storm water drainage within the existing refineries would not be altered. Therefore, the proposed rule amendments would not 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. Therefore, no significant adverse impacts to storm water runoff are expected as a result of the proposed project.

The proposed project does not include the construction of new or relocation of existing housing or any other 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”). No new construction is associated with the proposed project at refineries. 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.

3.3.3.9 Land Use and Planning

Based on a review of the applicable land use plans, the proposed rule amendments would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The proposed project has no components which would affect land use plans, policies, or regulations as no new development or physical refinery modifications would be expected. Habitat conservation or natural community conservation plans, agricultural resources or operations, would not be affected by the proposed project, and divisions of existing communities would not occur. Therefore, current or planned land uses within the District will not be affected as a result of the proposed rule amendments.

3.3.3.10 Mineral Resources

The proposed rule amendments are not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

3.3.3.11 Noise

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. No new major industrial equipment is expected to be required to be installed due to the proposed project so that no noise impacts associated with the proposed project are expected. Further, the refineries are regulated by local noise ordinances.

The proposed project is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. No construction equipment or activities that would generate vibration (e.g., backhoes, graders, jackhammers, etc.) is required to comply with the proposed rule amendments and no modifications to refinery equipment are required. The existing refineries are not located within existing airport land use plans. The proposed new and amended regulations would not locate residents or commercial buildings or other sensitive noise sources closer to airport operations. Thus, there are no components of the proposed regulations that would increase ambient noise levels, either intermittently or permanently.

3.3.3.12 Population and Housing

Population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). 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 new and amended regulations will affect five refineries in Contra Costa and Solano counties. It is not expected that the affected refineries would need to hire additional personnel to implement the proposed rule amendments and no construction is expected to be required. Additional labor was required to monitor fugitive equipment under Rule 11-10; however, the proposed amendments Rule 11-10 will reduce the frequency of monitoring required for cooling towers. As such, adopting the proposed rule amendments are not expected to need additional workers or induce population growth.

3.3.3.13 Public Services

There is no potential for adverse public service impacts as a result of adopting the proposed rule amendments as it would not result in the need for new or physically altered government facilities to maintain acceptable service ratios, response times, or other performance objectives. All of the affected refineries have on-site security and fire protection personnel, so no increase in police or fire protection services is expected. Implementing the proposed rule would not cause a future population increase, thus it is not expected to affect land use plans, future development, or the demand for public facilities such as schools and parks.

3.3.3.14 Recreation

As discussed under “Land Use and Planning” and “Population and Housing,” there are no provisions of the proposed rule amendments that would affect land use plans, policies, ordinances, or regulations as land use and other planning considerations are determined by local governments. No land use or planning requirements, including those relating to recreational facilities, will be altered by the proposed rule amendments. The proposed project does not have the potential to directly or indirectly induce population growth or redistribution. As a result, the proposed project would not increase the use of, or demand for, existing neighborhood or regional parks or other recreational facilities nor require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

3.3.3.15 Transportation and Traffic

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. It is not expected that the affected refineries would need to hire additional personnel to implement the proposed rule amendments and no construction is expected to be required. Additional labor was required to

monitor cooling towers under Rule 11-10; however, the proposed Rule 11-10 amendments will reduce the frequency of monitoring required for cooling towers. As such, adopting the proposed rule amendments is not expected to require any new employees or generate additional truck traffic associated with equipment/material delivery.

The proposed rule amendments would not affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways are expected. No changes are expected to parking capacity at or in the vicinity of affected refineries as the proposed project would not require additional employees. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

The proposed rule amendments are not expected to involve the delivery of materials via air so no increase in air traffic is expected. The proposed project is not expected to increase traffic hazards or create incompatible uses. No effect on emergency access to affected refineries would occur from adopting the proposed rule amendments as traffic is not expected to increase. The proposed project is not expected to have a significant adverse impact on traffic hazards, create incompatible uses or restrict emergency access. The proposed rule amendments affect existing refineries and would not conflict with adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, bicycle racks) as no increase in employees or other traffic is expected.

3.3.3.16 Tribal Cultural Resources

As discussed in Section V, Cultural Resources, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The proposed amendment rules would only affect refineries and would not require the demolition, construction or operation or any additional refinery equipment. Affected refineries may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3), are not listed or eligible for listing in the California Register of Historic Resources or a local register of historical resources (Public Resources Code Section 5020.1(k), and are not considered to have cultural value to a California Native American Tribe.

Further, no construction activities are required to implement the proposed rule amendments at the refineries; therefore, no grading is required and the proposed project would not require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. The proposed rule amendments would not result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources. No tribes have requested consultation under the AB52 requirements.

Since no construction activities are required, the proposed rule amendments would not affect historical or tribal resources as defined in Public Resources Section 5020.1(k), or 5024.1. Therefore, no impacts to tribal resources are anticipated to occur as a result of the proposed project.

3.3.3.17 Utilities and Service Systems

The proposed project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements from daily to weekly, for example (Rule 11-10), or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. The refineries affected by the proposed rule amendments already exist and already use water, generate wastewater, treat wastewater, and discharge wastewater under existing wastewater discharge permits. The proposed rule amendments would not require new equipment or result in an increase in water demand or an increase in wastewater discharge. As discussed in Hydrology and Water Quality, no water use and wastewater impacts are expected. Additionally, the proposed project would not require additional electricity, natural gas, refinery fuel gas, or any other type of fuel

Implementation of the proposed rule amendments would not require any new refinery equipment or modifications. Therefore, the proposed project would not alter the existing drainage systems or require the construction of new storm water drainage facilities. Nor would the proposed amendments 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. The proposed project is not expected to generate any increase in hazardous or solid waste. Therefore, no adverse impacts are expected to landfill capacity or compliance with federal, state and local statutes and regulations related to solid waste as a result of the proposed amendments.

CHAPTER 4

ALTERNATIVES ANALYSIS

Discussion of Alternatives
Description of Alternatives
Environmental Impacts of Project Alternatives
Conclusion
Comparison of Alternatives

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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, one of the proposed projects could result in potentially significant impacts to air quality due to ROG emissions foregone. Therefore, alternatives analysis should focus on alternatives that avoid or minimize these potentially significant impacts. The project objectives are as follows:

1. Resolve legal challenges to Rules 6-5, 11-10, and 12-15;
2. Clarify language in the currently approved versions of Rules 6-5, 11-10, and 12-15 to provide better understanding of the requirements, and easier implementation of the rules;
3. Assure that Rules 6-5, 11-10, and 12-15 can be implemented consistently;
4. Reduce the emissions of ozone precursors (ROG) to help achieve the federal and state ambient air quality standards for ozone;
5. Reduce emissions of particulate matter to help achieve the state ambient air quality standards for PM₁₀ and PM_{2.5};
6. Accurately and consistently characterize emissions from refinery-related emissions sources in an on-going basis to determine if additional emission reductions can be achieved;
7. Determine if significant changes to the crude slate result in increased emissions of air pollutants;
8. Ensure refineries comply with the ambient air quality standards for PM₁₀ and PM_{2.5}; and
9. Provide information to the public on refinery emissions, and significant crude slate changes.

Chapter 4 provides a discussion of alternatives to the proposed projects as required by CEQA. According to the CEQA guidelines, alternatives should include feasible measures to attain the basic objectives of the proposed projects 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.

4.2 DESCRIPTION OF THE PROJECT ALTERNATIVES

The possible alternatives to the proposed rule are limited by the nature of the project. Other than the No Project Alternative, the other alternatives are limited to modifications to Rule 11-10 only. This is because the proposed amendments to Rule 6-5 and 12-15 would not result in any physical modifications to refineries and will have no significant impacts. The potentially significant impacts associated with the proposed rule amendments are limited to the proposed amendments to Rule 11-10 due to the change in frequency of monitoring activities which could potentially result in a significant increase in ROG emissions, as compared to the currently approved Rule 11-10. Therefore, the alternatives will be limited to alternatives to Rule 11-10 (except for the No Project Alternative).

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 rule amendments would not be adopted and the currently approved version of Rules 6-5, 11-10, and 12-15 would be implemented. There would be no revisions made to Rule 6-5 to clarify that the rule does not apply to refineries that operate Wet Gas Scrubbers on their FCCUs. Further, revisions would not be made to Rule 11-10 to clarify exemptions for small cooling towers and cooling towers not in petroleum refining service. In addition, Rule 11-10 would not be amended to allow for weekly monitoring instead of the currently required daily monitoring. Finally, under Alternative 1, Rule 12-15 would not be modified to eliminate ships and trains from emissions inventories, clarify the use of non-crude feedstocks, clarify fence-line monitoring requirements, clarify the inventory and air monitoring guidelines, and modify the requirements for handling confidential information.

4.2.2 ALTERNATIVE 2 – IMPLEMENT AMENDMENTS TO RULES 6-5 AND 12-15 ONLY

Alternative 2 would implement the proposed amendments to Rules 6-5 and Rule 12-15 only. The amendments to Rule 11-10 would not be implemented under Alternative 2 and Rule 11-10 would be implemented as currently adopted. Therefore, the monitoring requirements under Rule 11-10 would remain as daily or continuous monitoring.

4.2.3 ALTERNATIVE 3 – MODIFY MONITORING FREQUENCY OF RULE 11-10

As currently adopted, Rule 11-10 requires weekly monitoring of cooling towers smaller than 2,500 gpm water circulation capacity and that any identified leaks be repaired in five calendar days. The proposed amendments to Rule 11-10 would keep the monitoring frequency to once every week and require that leaks be minimized as soon as practicable or within seven calendar days (rather than five days). Operators would also be able to do monthly sampling schedule if sampling results are below the Leak Action Level for four consecutive weeks.

Under Alternative 3, the weekly monitoring frequency of Rule 11-10 would be retained, but the option to go to a monthly sampling schedule if sampling results are below the Leak Action Level would be removed. This would help to minimize the time it takes to discover and repair a leak. Rules 6-5 and 12-15 would be implemented as currently proposed.

4.2.4 ALTERNATIVE 4 – MODIFY MONITORING FREQUENCY OF RULE 11-10

As currently adopted, Rule 11-10 requires daily or continuous monitoring of cooling towers greater than 2,500 gpm water circulation capacity and that any identified leaks be repaired in five calendar days. The proposed amendments to Rule 11-10 would change the monitoring frequency to once every week instead of once every day, and require that leaks be minimized as soon as practicable or within seven calendar days (rather than five days). Operators would be able to go to a twice-monthly sampling schedule, if sampling results are below the Leak Action Level for six consecutive months.

Under Alternative 4, the monitoring frequency of Rule 11-10 would be modified for cooling towers greater than 2,500 gpm to a weekly monitoring schedule, but the option to go to a twice-monthly sampling schedule if sampling results are below the Leak Action Level would be removed. This would help to minimize the time it takes to discover and repair a leak. Rules 6-5 and 12-15 would be implemented as currently proposed.

4.3 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES

4.3.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

4.3.1.1 Air Quality

Under Alternative 1, the proposed amendments to Regulations 6-5, 11-10, and 12-15 would not be implemented. No construction emissions were expected under any of the proposed rule amendments and no operational air quality impacts were identified for Rules 6-5 and 12-15.

The operational air quality impacts associated with the proposed amendments to Rule 11-10 were determined to be potentially significant. The daily or continuous monitoring requirements for cooling towers larger than 2,500 gpm (Rule 11-10 as adopted) was expected to reduce ROG emissions to between 48 and 90 tons per year (see Table 3.2-10). The proposed amendments to Rule 11-10 (weekly monitoring for cooling towers larger than 2,500 gpm) are estimated to result in ROG emissions from heat exchanger leaks at an estimated range from 64 to 91 tons per year. The highest impact case (using emission calculation Method 1) is where the potential ROG emissions foregone associated with the proposed amendments to Rule 11-10 were estimated to be 16 tons per year (64-48 tons per year, see Table 3.2-10) and potentially significant. Under the No Project Alternative there would not be any theoretical ROG emission reductions “foregone.”

The District has reviewed the costs and requirements associated with daily or continuous monitoring with the affected refineries since the approval of the Rule 11-10 in December 2015. The use of continuous monitors has a number of limitations at this time, which include the sensitivity of the analysis (detection limits are not low enough) and the reliability of the monitors (frequent downtime) so continuous monitors are not considered to be feasible at this time. The only method to reduce ROG emissions from cooling towers is more frequent monitoring and repair.

However, the incremental cost effectiveness of daily monitoring associated with implementation of Rule 11-10 as currently adopted when compared to weekly monitoring was determined to be over \$100,000 per ton of ROG emissions controlled, which exceeds the cost effectiveness determinations generally used by the District, which are more in the range of \$25,000 to \$35,000 per ton of emissions controlled. Therefore, Alternative 1 (implementation of Rule 11-10 as currently approved) is not cost effective and, therefore, is not feasible.

Per CEQA Guidelines §15364, “feasible” “means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” Therefore, continuous emission monitors are not feasible based on technological factors. Monitoring on a daily basis is not feasible because it is not cost effective. In addition, the legal challenges to the three refinery rules could continue under Alternative 1, although the outcome of the court

decision cannot be determined at this time. Based on the above, the No Project Alternative is not feasible at this time.

4.3.2 ALTERNATIVE 2 – IMPLEMENT AMENDMENTS TO RULES 6-5 AND 12-15 ONLY

4.3.2.1 Air Quality

Under Alternative 2, the proposed amendments to Regulations 6-5 and 12-15 would be implemented. No construction emissions were expected under the proposed rule amendments for Rule 6-5 and 12-15. Further no operational air quality impacts were identified for Rules 6-5 and 12-15. Under Alternative 2, the proposed amendments to Regulation 11-10 would not be implemented; however, the proposed amendments to Rules 6-5 and 12-15 would be implemented.

The operational air quality impacts associated with the proposed amendments to Rules 6-5 and Rule 12-15 were determined to be less than significant and would remain less than significant under Alternative 2. The operational air quality impacts associated with the proposed amendments to Rule 11-10 were determined to be potentially significant. The potential ROG emission reductions foregone associated with the proposed amendments to Rule 11-10 were estimated to range from 1 to 16 tons per year and, thus, are considered to be potentially significant. Under the Alternative 2, there would not be any theoretical ROG emission reductions “foregone.”

The District has reviewed the costs and requirements associated with daily or continuous monitoring with the affected refineries since the approval of Rule 11-10 in December 2015. As discussed under Alternative 1, continuous monitors have a number of limitations at this time, which include the sensitivity of the analysis (detection limits are not low enough) and the reliability of the monitors (frequent downtime) so continuous monitors are not considered to be feasible at this time. In addition, the incremental cost effectiveness of daily monitoring associated with implementation of Rule 11-10 as currently adopted when compared to weekly monitoring was determined to exceed the cost effectiveness determinations generally used by the District (\$25,000 to \$35,000 per ton of emissions controlled). Therefore, implementing Rule 11-10 as currently approved is not cost effective and, therefore, is not feasible at this time.

Alternative 2 would be feasible in that the proposed amendments to Rules 6-5 and 12-15 would be implemented, while the proposed amendments to Rule 11-10 would not be implemented. However, as discussed above, implementation of Rule 11-10 as currently approved is not feasible at this time because of technological factors and costs factors. Alternative 2 would potentially eliminate the legal challenges to Rules 6-5 and 12-15. However, the legal challenges to Rule 11-10 could continue under Alternative 2, although the outcome of the court decision cannot be determined at this time. Based on the above, Alternative 2 is not feasible at this time.

4.3.3 ALTERNATIVE 3 – MODIFY MONITORING FREQUENCY OF RULE 11-10

4.3.3.1 Air Quality

Under Alternative 3, the weekly monitoring frequency of Rule 11-10 would be retained, but the option to go to a monthly sampling schedule if sampling results are below the Leak Action Level would be removed for cooling towers smaller than 2,500 gallons per minute water circulation rate. This would help to minimize the time it takes to discover and repair a leak. Rules 6-5 and 12-15 would be implemented as currently proposed.

No construction emissions were expected under any of the proposed rule amendments and no operational air quality impacts were identified for Rules 6-5 and 12-15. These impacts would remain the same as the proposed project under Alternative 3.

The operational air quality impacts associated with the proposed amendments to Rule 11-10 were determined to be potentially significant. The potential ROG emissions foregone associated with the proposed amendments to Rule 11-10 were estimated to range from 1 to 16 tons per year and are considered potentially significant. Under the Alternative 3, the monitoring frequency of Rule 11-10 would continue to be a weekly monitoring schedule (as under the proposed amendments), but the option to go to a monthly sampling schedule if sampling results are below the Leak Action Level would be removed. This would help to minimize the time it takes to discover and repair a leak and reduce the theoretical ROG emissions “foregone.”

The District has reviewed the costs and emission impacts of no longer providing the option to go to a monthly sampling schedule if sampling results are below the Leak Action Level. The emission reductions under Alternative 3 were calculated using the same three methodologies described in Chapter 3.2.4. The emission reductions under Alternative 3 were estimated to range from 0.1 to 0.5 tons per year (BAAQMD, 2018c). These emission reductions would not be sufficient to reduce the potential ROG emission reductions foregone to less than the significance threshold of 10 tons per year. Therefore, air quality impacts under Alternative 3 would remain significant.

Under Alternative 3, costs from continuing the weekly sampling schedule are estimated to increase \$51,750 per year, with emission reductions estimated to range from 0.1 to 0.5 tons per year. Incremental cost effectiveness of Alternative 3 ranges from \$100,000 - \$500,000 per ton of ROG reduced, so Alternative 3 is not cost effective (BAAQMD, 2018c).

Alternative 3 would be feasible in that the proposed amendments to Rules 6-5 and 12-15 would be implemented, while the extended sampling period for small cooling towers would not be implemented. However, as discussed above, Alternative 3 is not feasible at this time because of costs factors. Alternative 3 would potentially eliminate the legal challenges to Rules 6-5 and 12-15. However, the legal challenges to Rule 11-10 could continue under

Alternative 3, although the outcome of the court decision cannot be determined at this time. Based on the above, Alternative 3 is not feasible at this time.

4.3.4 ALTERNATIVE 4 – MODIFY MONITORING FREQUENCY OF RULE 11-10

4.3.4.1 Air Quality

Under Alternative 4, the monitoring frequency of Rule 11-10 for cooling towers greater than 2,500 gpm water circulation rate would be modified to a weekly monitoring schedule, but the option to go to a twice-monthly sampling schedule if sampling results are below the Leak Action Level would be removed. This would help to minimize the time it takes to discover and repair a leak. Rules 6-5 and 12-15 would be implemented as currently proposed.

No construction emissions were expected under any of the proposed rule amendments and no operational air quality impacts were identified for Rules 6-5 and 12-15. These impacts would remain the same as the proposed project under Alternative 4.

The operational air quality impacts associated with the proposed amendments to Rule 11-10 were determined to be potentially significant. The potential ROG emission reductions foregone associated with the proposed amendments to Rule 11-10 were estimated to range from 1 to 16 tons per year and are considered potentially significant. Under the Alternative 4, the monitoring frequency of Rule 11-10 would be modified to a weekly monitoring schedule (as under the proposed amendments), but the option to go to a twice-monthly sampling schedule if sampling results are below the Leak Action Level would be removed. This would help to minimize the time it takes to discover and repair a leak and reduce the theoretical ROG emission reductions “foregone.”

The District has reviewed the costs and emission impacts of no longer providing the option to go to a twice-monthly sampling schedule if sampling results are below the Leak Action Level. The emission reductions under Alternative 4 were calculated using the same three methodologies described in Chapter 3.2.4. The emission reductions under Alternative 4 were estimated to range from 0.4 to 6.1 tons per year (BAAQMD, 2018c). These emission reductions would not be sufficient to reduce the potential ROG emission reductions foregone to less than the significance threshold of 10 tons per year. Therefore, air quality impacts under Alternative 4 would remain significant.

Under Alternative 4, costs from continuing the weekly sampling schedule are estimated to increase \$62,500 per year, with emission reductions estimated to range from 0.4 to 6.1 tons per year. Incremental cost effectiveness of Alternative 4 ranges from \$10,200 - \$156,000 per ton of ROG reduced (BAAQMD, 2018c). The most significant cost impact from Alternative 4 exceeds the cost effectiveness determinations generally used by the District, so Alternative 4 is not cost effective.

Alternative 4 would be feasible in that the proposed amendments to Rules 6-5 and 12-15 would be implemented, while the extended sampling period for large cooling towers would not be implemented. However, as discussed above, Alternative 4 is not feasible at this time because it is not cost effective. Alternative 4 would potentially eliminate the legal challenges to Rules 6-5 and 12-15. However, the legal challenges to Rule 11-10 could continue under Alternative 4, although the outcome of the court decision cannot be determined at this time. Based on the above, Alternative 4 is not feasible at this time.

4.4 CONCLUSION

Alternative 1 - No Project Alternative would theoretically reduce the potentially significant impacts associated with operational emissions increases under Rule 11-10, i.e., ROG emission reductions foregone. However, Alternative 1 is not feasible because the implementation of Rule 11-10 as currently approved is not feasible due to both economic and technological factors. The implementation of the currently approved Rules 6-5, 11-10, and 12-15 could result in the continuation of legal challenges to the rules under Alternative 1, although the outcome of the court decision cannot be determined at this time. Further, Alternative 1 would not achieve project objectives 1 through 3 (see page 4-1)

Under Alternative 2, the proposed amendments to Regulations 6-5 and 12-15 would be implemented, but not the proposed amendments to Regulation 11-10. The impacts under Alternative 2, would essentially be the same as the No Project Alternative because the proposed amendments to Rules 6-5 and 12-15 would not result in any significant air impacts issues (no construction or operational air emissions). Under Alternative 2, Rule 11-10 would not be implemented which would theoretically eliminate the ROG emission reductions foregone. However, implementing Rule 11-10 as currently approved is not considered to be feasible due to both economic, and technological factors. The implementation of the currently approved Rule 11-10 could result in the continuation of legal challenges to the rules under Alternative 2, although the outcome of the court decision cannot be determined at this time. Alternative 2 would better achieve the project objectives, than Alternative 1 but the project objectives associated with Rule 11-10 would not be achieved. Alternative 2 would achieve the following project objectives in addition to objectives 4 through 9 (see Page 4-1):

- Resolve legal challenges to Rules 6-5 and 12-15 (Alternative 2 would not resolve the legal challenges to Rule 11-10);
- Clarify language in the currently approved versions of Rule 6-5 and 12-15 to provide a better understanding of the requirements and easier implementation of the rules (Alternative 2 would not clarify the language of Rule 11-10);
- Assure that Rules 6-5 and 12-15 can be implemented consistently (this objective would not be achieved for Rule 11-10 under Alternative 2);

Under Alternative 3 and Alternative 4, the monitoring frequency of Rule 11-10 would be modified to a weekly monitoring schedule, but the option to go to an extended sampling schedule if sampling results are below the Leak Action Level would be removed. This would help minimize the time it takes to discover and repair a leak. Rules 6-5 and 12-15 would be implemented as currently proposed. Under Alternative 3, the theoretical ROG emission reductions foregone associated with Rule 11-10 would be reduced from 0.1 to 0.5 tons per year. However, Alternative 3 is found to not be feasible because these emission reductions are not adequate to reduce the foregone emission reductions to less than 10 tons per year. Under Alternative 4, the theoretical ROG emission reductions foregone associated with Rule 11-10 would be reduced from 0.4 to 6.1 tons per year. However, Alternative 4 is found to not be feasible because these emission reductions are not adequate to reduce the foregone emission reductions to less than 10 tons per year. Neither Alternative 3 nor Alternative 4 are feasible based on cost impacts, and are not adequate to reduce emissions impacts to less than significant. Alternative 3 and Alternative 4 would achieve the project objectives, with the potential exception of the resolving the legal challenges associated with Rule 11-10. It should be noted that the proposed projects, as well as the four alternatives would be considered to result in cumulatively considerable air quality impacts. The proposed modifications to Rule 11-10 could result in as much as 16 tons per year of ROG emissions foregone, which exceeds the 10 ton per year ROG significance threshold and, therefore, are potentially significant. As a result, air quality impacts from the proposed modifications to Rule 11-10 are also considered to be cumulatively considerable, pursuant to CEQA Guidelines §15064 (h)(1), since the district is not in attainment of the ozone ambient air quality standards and ROG is an ozone precursor. Further, the alternatives would not reduce the air quality impacts to less than significant, so that the air quality impacts for all four alternatives would also be cumulatively considerable.

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 4.5-1 provides this matrix comparison displaying the major characteristics and significant environmental effects of each alternative. Table 4.5-1 lists the alternatives considered in this EIR and how they compare to the 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.

As shown in Table 4.5-1, Alternative 1 would not eliminate the potentially significant ROG impacts to less than significant and would not achieve any of the proposed project objectives (not feasible due to economic and technological factors). Alternative 2 would also not reduce the potentially significant ROG impacts to less than significant but would achieve most of the objectives of the projects. Alternative 3 and Alternative 4 would reduce

the ROG impacts (but not to less than significant) and achieve most of the objectives of the projects. Since Alternative 3 and Alternative 4 would reduce the ROG impacts and achieve most of the objectives of the projects, they would be considered the environmentally superior alternative (although they are not economically feasible).

The projects as proposed would be considered the preferred alternative as it would achieve all of the objectives and is economically feasible.

**TABLE 4.5-1
COMPARISON OF ALTERNATIVES**

ENVIRONMENTAL TOPIC	Proposed Project	Alternative 1 No Project Alternative	Alternative 2 Implement Amendments to Rules 6-5 and 12-15 Only	Alternative 3 Modify Monitoring Frequency in Rule 11-10	Alternative 4 Modify Monitoring Frequency in Rule 11-10
Air Quality					
Construction Emissions	No Impact	No Impact	No Impact	No Impact	No Impact
Operational Criteria Pollutants	PS	PS*	PS*	PS*	PS*
Cumulative Air Quality Impacts	PS	PS*	PS*	PS*	PS*

Notes:

- PS = Potentially Significant
- PS* = Potentially Significant, because portions of the Alternative are not feasible.
- (-) = 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.

CHAPTER 5

REFERENCES

References
Organizations and Persons Consulted
List of Environmental Impact Report Preparers

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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.

Victor Douglas
William Guy
David Joe
Adan Schwartz
Guy Gimlen

5.3 LIST OF ENVIRONMENTAL IMPACT REPORT PREPARERS

Bay Area Air Quality Management District
San Francisco, California

Environmental Audit, Inc.
Placentia, California

APPENDIX A

NOTICE OF PREPARATION AND INITIAL STUDY

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California Environmental Quality Act
Notice of Preparation of Draft Environmental Impact Report
and Scoping Meeting
for Amendments to Refinery Rules

TO: Interested Parties

FROM: Bay Area Air Quality
Management District
375 Beale St., Suite 600
San Francisco, CA 94105

Lead Agency: Bay Area Air Quality Management District

Contact: Victor Douglas, Manager

Phone: (415) 749-4752

SUBJECT: NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Notice is hereby given pursuant to California Public Resources Code §21091, 21092, 21092.2, and 21092.3 and CEQA Guidelines Section 15085 and 15087 that the Bay Area Air Quality Management District ("Air District"), as lead agency, will prepare a Draft Environmental Impact Report (EIR) in connection with the project described below.

Project Title: Amendments to Refinery Rules: Rule 6, Particulate Matter, Rule 5: Particulate Matter Emissions from Refinery Fluid Catalytic Cracking Units; Regulation 11, Hazardous Pollutants, Rule 10: Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; and Regulation 12, Miscellaneous Standards of Performance, Rule 15: Petroleum Refinery Emissions Tracking

Project Location: The rule would apply within the Bay Area Air Quality Management District jurisdiction, 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: Amendments to the three Refinery rules clarify exemptions, definitions, and requirements for specific sections of all three rules. Amendments to Rule 6-5 are simply clarifications of original intent. Amendments to Rule 11-10 reduce monitoring of cooling towers for hydrocarbon leaks from daily to weekly, with provisions to extend monitoring periods after proving no leaks for an extended time. Costs for daily monitoring were found to be excessive relative to the potential hydrocarbon emission reductions. Requirements for cooling tower best management practices and reporting were eliminated when found to be focused primarily on Process Safety Management and cooling water chemistry rather than leak detection. Thresholds were established regarding Rule 12-15 requirements for non-crude oil feedstock imports, and processes for handling and securing confidential information were clarified.

Scoping Meetings: Notice is also given pursuant to California Public Resource Code, Sections 15206 and 15082 (c) that the Air District will conduct a California Environmental Quality Act (CEQA) scoping meeting at the Air District Headquarters' Yerba Buena Room, 375 Beale Street, San Francisco, California, on Monday, August 20, 2018 at 2:00 p.m. to discuss and accept oral comments on the scope and content described in a Notice of Preparation and an Initial Study (NOP/IS) prepared in anticipation of a draft Environmental Impact Report (DEIR) for the Refinery Rules.

Reviewing the Notice of Preparation/Initial Study (NOP/IS): The NOP/IS documents are available at the on the Air District's website at www.baaqmd.gov/ruledev, at Air District headquarters, or, by request, via mail or email. Requests for copies of the NOP/IS should be directed to Guy Gimlen (ggimlen@baaqmd.gov) at (415) 749-4734.

Comment Procedure: Comments relating to the environmental analysis in the NOP/IS should be addressed to Guy Gimlen, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to ggimlen@baaqmd.gov. Comments on the NOP/IS will be accepted until Friday, September 7, 2018 at 5:00 p.m.

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

**Initial Study for
Draft Amendments to Refinery Rules**

Prepared by:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94109

Contact: Guy Gimlen
(415) 749-4734

July 2018

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CHAPTER 1

PROJECT DESCRIPTION

Introduction

Agency Authority

Project Location

Project Background

Project Description

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CHAPTER 1

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District or Air District) is preparing the Refinery Rules - Draft Rule Amendments (Projects or Proposed Projects). These Projects involve developing draft amendments to previously adopted rules: Regulation 6, Rule 5 - Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs); Regulation 11, Rule 10 - Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers; and Regulation 12, Rule 15 - Petroleum Refining Emissions Tracking. The draft amendments aim to do the following:

The draft amendments to Regulation 6, Rule 5 (Rule 6-5) - Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs) include revisions to:

- Clarify exemptions and rule provisions.

The draft amendments to Regulation 11, Rule 10 (Rule 11-10) - Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers include revisions to:

- Modify and clarify limited exemptions for smaller cooling towers;
- Clarify a limited exemption for cooling towers not in petroleum refining service;
- Modify and clarify leak monitoring, action, and reporting requirements; and,
- Remove Best Modern Practices requirements and associated reporting requirements.

The draft amendments Regulation 12, Rule 15 (Rule 12-15) - Petroleum Refining Emissions Tracking include revisions to:

- Modify and clarify rule definitions and applicability;
- Clarify the Annual Emissions Inventory review and approval process;
- Modify and clarify fence-line monitoring plan requirements, and review and approval process;
- Modify the process for updating Emissions Inventory Guidelines and Air Monitoring Guidelines;
- Modify the monthly crude slate report requirements; and,
- Modify provisions for designating confidential information.

1.2 AGENCY AUTHORITY

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 these Projects and has prepared the Notice of Preparation/Initial Study (NOP/IS) for the proposed amendments to these refinery rules. These Projects are being addressed in the same CEQA document because they are moving through the

rule amendment process together. However, revisions to each of the rules is a distinct CEQA project independent of the others.

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 Air District 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 Air District 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 1.2-1).

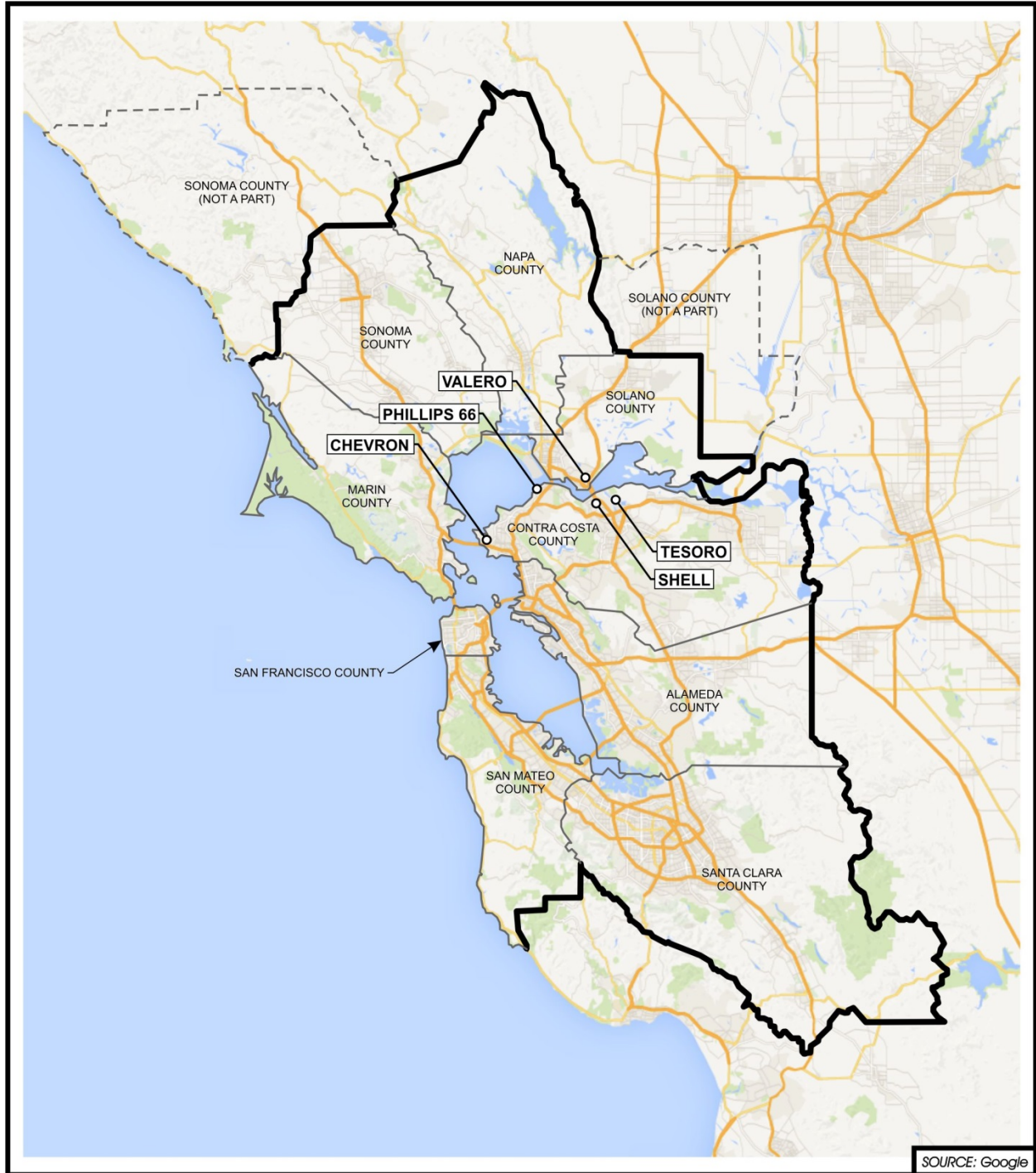
Currently, five petroleum refineries are located in the Bay Area within the jurisdiction of the Air District (see Figure 1.2-1). Four of the refineries are located in Contra Costa County and one refinery is located in Solano County:

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

1.4 PROJECT BACKGROUND

The Air District is developing draft amendments to two of three rules that were adopted by the Air District Board of Directors on December 16, 2015. These rules were challenged by three of the five Bay Area refineries in a lawsuit that was filed on January 22, 2016, *Valero, et al. v. Bay Area Air Quality Management District* (case number N16-0095), and amended on February 16, 2016. On March 24, 2017, the parties to the lawsuit entered an enforcement agreement and agreement to stay litigation for all three of these regulations (referred to as the “Valero Case Agreement”). Terms of the Agreement affect implementation of Rule 6-5, Rule 8-18, Rule 11-10. This document will use the phrase “2016 Refinery Rules” when referring to these three rules collectively. Specifically, the Air District staff committed in the Valero Case Agreement to implement the three rules that

were challenged for a limited period of time in a manner consistent with how the rules would be proposed to be changed. The intent of this provision is that the refineries should not have to implement in the near-term provisions that will change if the rules are amended as contemplated in the Valero Case Agreement. If the rules are not changed as contemplated in the Valero Case Agreement, the refineries will have to implement the rules as originally adopted in 2016.



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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

In that scenario, the refineries could reactivate their lawsuit and move forward with their legal challenge to the rules.

The Valero Case Agreement states the Air District will propose amendments to the 2016 Refinery Rules for adoption by the Air District Board of Directors by November 1, 2018. Draft amendments to Rule 8-18 – Equipment Leaks are not being put forth at this time, and will be delayed until a Refinery Heavy Liquids Fugitive Leaks study can be completed at all five Bay Area refineries. This study has been underway and findings are expected to be finalized in late 2018. Information from the study will be used to develop appropriate amendments for Rule 8-18, which are expected in Spring 2019.

In addition, the Air District is developing draft amendments to Regulation 12, Rule 15: Petroleum Refining Emissions Tracking (Rule 12-15), adopted by the Air District Board of Directors on April 20, 2016. Rule 12-15 was challenged in a lawsuit that was filed by the Western States Petroleum Association (WSPA) and three of the refineries individually on May 25, 2016, *WSPA, et al. v. Bay Area Air Quality Management District* (case number N16-0963). Similar to the Valero Case Agreement, parties to the lawsuit have entered an agreement to stay the WSPA case litigation contingent on the Air District proposing specified amendments to Rule 12-15 (but not Rule 9-14). This agreement, entered into as of March 1, 2018, will be referred to as the “WSPA Case Agreement.” Similar to the Valero Case Agreement, in the WSPA Case Agreement the Air District committed to implement Rule 12-15 for a limited period of time in a manner consistent with how Rule 12-15 would be changed as contemplated in the WSPA Case Agreement. The intent of this provision is that the refineries should not have to implement in the near-term provisions that will change if Rule 12-15 is amended as contemplated in the Agreement. If Rule 12-15 is not changed as contemplated in the WSPA Case Agreement, the refineries will have to implement Rule 12-15 as originally adopted. In that scenario, the refineries could reactivate their lawsuit and move forward with their legal challenge to Rule 12-15.

The draft amendments would apply to 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).

1.5 PROJECT DESCRIPTION

The Air District proposed rule amendments aim to amend Rules 6-5, Rule 11-10, and Rule 12-15. The draft amendments to Rule 6-5 would apply to four of the five Bay Area refineries with FCCUs. The draft amendments to Rule 11-10 and Rule 12-15 would apply to all five Bay Area refineries. These proposed rule amendments are described in the following subsections.

1.5.1 DRAFT AMENDMENTS TO RULE 6-5

The draft amendments to Rule 6-5 include revisions to provide more clarity and conciseness to Section 6-5-111 - Exemption, Emissions Abated by Wet Scrubber and Section 6-5-301 - FCCU Emission Limits. Both of these changes reflect changes in language for clarity purposes and do not represent substantive changes to Rule 6-5.

1.5.2 DRAFT AMENDMENTS TO RULE 11-10

The draft amendments to Rule 11-10 include revisions to modify limited exemption requirements; modify and clarify leak monitoring, action, and reporting requirements; and remove modern practice requirements and reporting.

Limited Exemptions for Smaller Cooling Towers: This amendment requires cooling towers with water recirculation rates of less than 2,500 gallons per minute (gpm) to be monitored once every other week instead of every week. Operators may also move to a monthly monitoring schedule if results are below the Leak Action Level for four consecutive weeks.

Limited Exemption for Cooling Towers Not in Petroleum Refining Service: This amendment is to clarify that cooling towers not in petroleum refining service are exempt from Rule 11-10.

Leak Monitoring, Action, and Reporting Requirements: An amendment to total hydrocarbon leak monitoring will require cooling towers to be sampled once every week instead of once every day. Operators will be able to move to a bi-monthly sampling schedule if sampling results are below the Leak Action Level for six consecutive months. Further, leak action requirements will be amended to require cooling tower hydrocarbon leaks to be minimized as soon as practicable or within seven calendar days (rather than five calendar days) to provide time for necessary leak minimization delays associated with potential technical and/or safety constraints.

Finally, an amendment to Refinery cooling tower reporting requirements clarifies that sampling of the cooling tower water must occur as soon as feasible, and no later than 24 hours from the discovery of the leak. This has been amended to require notification to the Air District's Air Pollution Control Officer (APCO) of total hydrocarbon concentration and chlorine concentration within 72 hours (rather than one calendar day) of discovering the leak. The draft amendment also removes the requirements to report lists of all heat exchangers served by the cooling tower, as well as the pH level and iron concentration of the cooling water, as this reporting is unlikely to provide additional substantive information regarding the hydrocarbon emissions from the cooling tower. Notification requirements are also being added for delays in repair that meet the criteria cited in 40 CFR 63.654(f)-(g), as referenced in amended Section 11-10-305.

Best Modern Practices Requirements and Reporting: Section 11-10-402: Best Modern Practices is being deleted to avoid potential duplication and conflicts with process safety management requirements. Section 11-10-504: Operating Records is being amended to remove recordkeeping requirements associated with the deleted Section 11-10-402, as these recordkeeping requirements are no longer applicable.

1.5.3 DRAFT AMENDMENTS TO RULE 12-15

The draft amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan requirements, procedures for updating guidelines, crude slate reporting requirements, and confidential information designation procedures, as described below.

Rule Definitions and Applicability: The requirement to include emissions from cargo carriers (ships and trains) in the emissions inventory data has been removed as they are not under the control or authority of the refineries. The definition of monthly crude slate report is being amended to better focus on non-crude feedstocks that may be serving as a substitute for crude feedstocks. Non-crude feedstocks are introduced at refineries across a vast spectrum of uses and is often in very small quantities. To better effect the intent of the Rule, a threshold will be established below which non-crude feedstocks need not be addressed in the crude slate report.

Emission Factors and Calculation Methodology: Section 12-15-401 - Annual Emissions Inventory is being amended to clarify the calculation methodology to be used for calculating greenhouse gases using a “common pipe” method, when many fuel consumers use fuel from one “common pipe” source.

Annual Emissions Inventory Review and Approval Process: This section is being amended to clarify the process for communicating and issuing preliminary review determinations under Subsection 12-15-402.1. The draft amendment also clarifies the notification process for APCO extension of the Air District’s review period under Subsection 12-15-402.3, and sets a limit of 45 days for the extension of the review period.

Fence-line Monitoring Plan Requirements and Review Process: Air Monitoring Plan requirements are being amended to clarify that site-specific air monitoring plans will be allowed to have implementation schedules and dates that are tailored to the specific plan, due to the unique set of circumstances of each individual refinery. The process for issuing preliminary review determinations has also been amended for clarity. Finally, amendments to Section 12-15-501 - Fence-line Monitoring System clarify that the requirements of the section will be effective once the fence-line monitoring system is installed and operational.

Update of Emissions Inventory Guidelines and Air Monitoring Guidelines: Draft amendments to the guideline update process include a 60-day comment period for affected facilities to review and comment on changes to the Emissions Inventory Guidelines and Air Monitoring Guidelines. Further, the Air District will respond to comments received. Affected facilities will be given at least 90 days to implement changes from the updated Emissions Inventory Guidelines in their respective annual emissions inventories.

Monthly Crude Slate Report Requirements: Section 12-15-408 - Availability of Monthly Crude Slate Reports is being amended to validate that the historical monthly crude slate data required for years 2013, 2014, 2015, and 2016 will be based on records

maintained by the refinery in the normal course of business. The draft amendments to this section also define precautions and procedures for handling confidential data for inspection, audit, and review. The draft amendments ensure that refinery confidential data is protected appropriately, and remains on-site at the refinery and is prevented from inadvertent release. Subsection 12-15-408.2 is being amended to modify the summarized information required in the monthly crude slate report.

Designation of Confidential Information: Requirements regarding confidential information have been amended to defer to the amended Sections 12-15-209 and 12-15-408. The requirements for an owner/operator to provide a redacted version of the document have been removed.

CHAPTER 2

ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Significant

Determination

Evaluation of Environmental Impacts

Summary of Proposed Project and Potential Impacts

Environmental Checklist and Discussion

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CHAPTER 2**2.0 ENVIRONMENTAL CHECKLIST****2.1 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 projects.

2.2 GENERAL INFORMATION

Project Title:	Draft Amendments to Refinery Rules
Lead Agency Name:	Bay Area Air Quality Management District 375 Beale Street
Lead Agency Address:	San Francisco, California 94105
Contact Person:	Guy Gimlen
Contact Phone Number:	415-749-4734
Project Location:	The proposed Project applies to the area within the jurisdiction of the Bay Area Air Quality Management District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
Project Sponsor's Name:	Bay Area Air Quality Management District 375 Beale Street
Project Sponsor's Address:	San Francisco, California 94105
General Plan Designation:	The proposed Projects relate to refineries located within the District which are located in land use areas designated as industrial.
Zoning:	The proposed Projects apply to five petroleum refineries within the District, which are located in industrially zoned areas.
Description of Project:	See "Project Description" in Chapter 1.
Surrounding Land Uses and Setting:	See "Project Location" in Chapter 1.
Other Public Agencies Whose Approval is Required:	None

2.3 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed Projects. As indicated by the checklist on the following pages, environmental topics marked with a "✓" may be adversely affected by the proposed Projects. 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 type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Population / Housing | <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation / Traffic | <input type="checkbox"/> Utilities / Service Systems | <input type="checkbox"/> Mandatory Findings of Significance |

2.4 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.

Original NOP/IS signed and submitted 8/1/2018

Signature:

Date:

Printed Name:

Date:

2.5 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.

2.6 SUMMARY OF PROPOSED PROJECT AND POTENTIAL IMPACTS

Chapter 2 provides a summary of the main components of proposed amendments to Regulations 6-5, 11-10, and 12-15. A summary of the expected methods of compliance is provided below.

- **Draft Amendments Rule 6-5 – Particulate Emissions from Refinery Fluidized Catalytic Cracking Units (FCCUs):** The draft amendments to Rule 6-5 apply to four of the five Bay Area refineries with FCCUs. The draft amendments clarify exemptions to the rule (it does not apply to FCCUs with wet scrubbers) and deletes placeholders in the existing rule for future limits on condensable matter and sulfur dioxide. The draft amendments to Rule 6-5 would have no impact on emissions as the amendments are clarifications of the original intent of Rule 6-5.
- **Draft Amendments to Rule 11-10 – Hexavalent Chromium Emissions from All Cooling Towers and Total Hydrocarbon Emissions from Petroleum Refinery Cooling Towers:** Compliance with the amendments to Rule 11-10 is expected to be achieved through monitoring and repair programs. Amendments to Regulation 11-10 would require cooling towers to be sampled once every week (rather than once every day) and that leaks be minimized as soon as practicable or within seven calendar days (rather than five). Amendments to Regulation 11-10 would also clarify limited exemptions for cooling towers not in petroleum refining service and would require less frequent monitoring for smaller cooling towers. The draft amendments to Rule 11-10 will not impact actual emissions because the amendments are consistent with how the Rule has been implemented since adoption. The draft amendments may impact emissions if compared to the rule as adopted due to reduced frequency in monitoring and potential leak detection.

- **Draft Amendments to Rule 12-15 - Petroleum Refining Emissions Tracking:** The Proposed Amendments to Rule 12-15 include revisions to modify and clarify definitions and rule applicability, emission calculation methodologies, emission inventory review and approval requirements and procedures, fence-line monitoring plan requirements, procedures for updating guidelines, crude slate reporting requirements, and confidential information designation procedures. Rule 12-15 is an emissions reporting rule, so no controls are required, no impacts on emissions is expected and no physical impacts to the refineries would occur.
- **Draft Amendments to Rule 8-18 - Equipment Leaks:** Compliance with the amendments to Rule 8-18 is expected to be achieved through improved and more stringent leak detection and repair programs that will require monitoring of additional fugitive components, more frequent monitoring of some components, and potentially more repair of fugitive components. Draft amendments to Rule 8-18 are not being put forth at this time and will be delayed until a Refinery Heavy Liquids Fugitive Leaks study can be completed at all five Bay Area refineries. To provide a complete review, potential amendments to Rule 8-18 will be included as a cumulative project in the EIR.

The impacts of these expected methods of compliance are evaluated in this Initial Study. CEQA recognizes that regulatory requirements consisting of monitoring and inspections, do not typically generate environmental impacts (see for example, CEQA Guidelines §15309). The analysis of potential secondary adverse environmental impacts from control strategies identified in Chapter 1 as a result of implementing amendments to Rules 6-5, 11-10, and 12-15 have been further analyzed in the subsections below.

2.7 ENVIRONMENTAL CHECKLIST AND DISCUSSION

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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 type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The Bay Area Air Quality Management District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano County and southern Sonoma County. 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. Important views of natural features include the San Francisco Bay and ocean, San Francisco Bay, Mount Tamalpais, Mount Diablo, and other peaks and inland valleys of the Coast Range. Cityscape views offered by buildings and distinctive Bay Area bridges, especially the Golden Gate and Bay Bridges and the San Francisco skyline, are also important built visual resources to the region (ABAG, 2017). Views along travel corridors, including roads and rail lines, are in abundance in the Bay Area and include views of the San Francisco Bay, city scape, mountains and hills, redwood groves, and broader views of the ocean and lowlands, such as along ridgelines. Because of the variety of visual resources, scenic highways or corridors are located throughout the Bay Area and includes 15 routes that have been designated as scenic highways and 29 routes eligible for designation as scenic highways (ABAG, 2017).

The proposed rule amendments would affect the five refineries within the Bay Area. Petroleum refineries are generally located in industrial areas.

Regulatory Background

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

Significance Criteria

Project-related impacts on aesthetics and visual resources will be considered significant if any of the following conditions are met:

- The proposed Project would have a substantial adverse effect on a scenic vista.
- The proposed Project would substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historical buildings within a state scenic highway.
- The proposed Project would substantially degrade the existing visual character or quality of the site and its surrounds.
- The proposed Project would add a visual element of urban character to an existing rural or open space area or add a modern element to a historic area.
- The proposed Project would create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

Discussion of Impacts

I a – c. Rules 6-5, 11-10, and 12-15 were part of the District’s focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of particulate matter (PM), particulate matter less than 2.5 microns in diameter (PM_{2.5}), reactive organic gases (ROG), nitrogen oxides (NO_x), sulfur dioxide (SO₂), and ammonia (NH₃) from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. None of the proposed rule amendments are expected to result in visual changes to the refineries. Therefore, obstruction of scenic resources or degrading the visual character of a site, including but not limited to: trees, rock outcroppings, or historic buildings, is not expected.

I d. The proposed Projects are not expected to require any new equipment or any new light generating equipment for compliance. The existing refineries are current lighted for nighttime work and no additional light or glare would be added to impact day or nighttime views in the Bay Area.

Conclusion

Based upon the above considerations, significant adverse impacts to aesthetics or light and glare are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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 FOREST 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))? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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 Air District 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. Agricultural land under Williamson Act contract includes both prime and nonprime lands. Prime agricultural land includes land with certain specific soil characteristics, land that has returned a predetermined annual gross value for three of the past five years, livestock-supporting land with specific carrying capacities, or land planted with fruit or nut trees, vines, bushes or crops that have a non-bearing period of less than five years (Government Code §51200-51207). Nonprime lands include pasture and grazing lands and other non-irrigated agricultural lands with lesser soil quality.

The Bay Area has a significant amount of land in agricultural uses. In 2010, approximately over half of the region's approximately 4.5 million acres were classified as agricultural lands, as defined by the California Department of Conservation Farmland Mapping and Monitoring Program. Of these, 2.3 million acres of agricultural land, over 70 percent (about 1.7 million acres) are used for grazing. Products grown in the Bay Area include field crops, fruit and nut crops, seed crops, vegetable crops, and nursery products. Field crops, which include corn, wheat, and oats, as well as pasture lands, represent approximately 62 percent of the Bay Area agricultural land (ABAG, 2017). In 2014, about 1.25 million acres of land were under Williamson Act contract in the Bay Area. Of this, about 203,200 acres were prime farmland and one million acres were nonprime. Lands under Williamson Act contract are primarily used for pasture and grazing and not for cultivation of crops. Approximately 70 percent of prime farmlands under contract are in Santa Clara, Solano, and Sonoma counties (ABAG, 2017).

The proposed rule amendments would affect the five refineries within the Bay Area. Petroleum refineries are generally located in industrial areas. Agricultural or forest resources are typically not located within these industrial areas within the Bay Area.

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.

Significance Criteria

Project-related impacts on agricultural and forest resources will be considered significant if any of the following conditions are met:

- The proposed Project conflicts with existing zoning or agricultural use or Williamson Act contracts.

- The proposed Project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed Project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- The proposed Project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Discussion of Impacts

II a – e. Rules 6-5, 11-10, and 12-15 were part of the District’s focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

The proposed rule amendments would affect petroleum refineries that are located within industrial areas and no agricultural or forest resources are located within refineries. The proposed Projects would not conflict with existing agriculture related zoning designations or Williamson Act contracts. Williamson Act lands within the boundaries of the District would not be affected. No effects on agricultural or forestland resources are expected because the proposed Project would not require any new development. All of these activities associated with the proposed rule amendments would occur within the confines of the existing refineries. Therefore, there is no potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract, or impacts to forestland resources.

Conclusion

Based upon the above considerations, significant adverse impacts to agricultural and forest resources are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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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III. AIR QUALITY

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

- | | | | | |
|--|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Violate any air quality standard or contribute to an existing or projected air quality violation? | <input 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 checked="" type="checkbox"/> | <input type="checkbox"/> |

Setting

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), and lead.

The San Francisco Bay Area is characterized by a large, shallow basin surrounded by mountain ranges tapering into sheltered inland valleys. The basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of mountains, valleys and bays. 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.

Air quality conditions in the San Francisco Bay Area have improved greatly since the Air District was created in 1955, and regional concentrations of criteria pollutants are now in compliance with or near compliance with most ambient air quality standards. However, the Bay Area is not in attainment with the National and State 8-hour ozone standards and the State one-hour ozone standard. The Bay Area is also not in attainment for the California standards for PM₁₀ and PM_{2.5}. NO_x and other pollutants react to produce secondary PM_{2.5} in the form of nitrates. NO_x reductions will have the added benefit of reducing secondary PM_{2.5} formation.

Regulatory Background

Criteria Pollutants

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

The Air District is governed by a 24-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 Air District 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

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 NESHAPs were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards 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 regulatory programs for the control of TACs, including: (1) California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), 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; and (2) The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656) established 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.

In 2004, the Air District initiated the Community Air Risk Evaluation (CARE) program to identify areas with relatively high concentrations of air pollution – including toxic air contaminants (TACs) and fine particulate matter – and populations most vulnerable to air pollution's health impacts. Maps of communities most impacted by air pollution, generated through the CARE program, have been integrated into many Air District programs. For example, the Air District uses 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.

Significance Criteria

On June 2, 2010, the Air District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These CEQA thresholds were designed to establish the level at which the Air District believed air pollution emissions would cause significant environmental impacts under CEQA. The CEQA thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards.

In view of the Supreme Court's opinion, local agencies may rely on the Air District's CEQA thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the CEQA thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts.

The Air District published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The CEQA Guidelines for implementation of the Thresholds are for information purposes only to assist local agencies.

Recommendations in the Guidelines are advisory and should be followed by local governments at their own discretion. The Air District is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance. Since these are the most current air quality significance thresholds and address court decisions, they will be used in the CEQA analysis for the current Project.

Construction Emissions

Regarding construction emissions, the Air District's 2017 Thresholds of Significance will be used in the current air quality analysis for construction emissions (see Table 2-1).

TABLE 2-1

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NO _x	54
PM ₁₀	82*
PM _{2.5}	54*
PM ₁₀ / PM _{2.5} Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.
Source: BAAQMD, 2017

Operational Emissions

The most recently available CEQA Guidelines established emission thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans and community plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of "no net increase in emissions" is appropriate for Air Quality Plans because they include a mix of several control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The 2017 project-level stationary source CEQA thresholds are identified in Table 2-2. These represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects. The Air District does not currently have significance thresholds specifically for rules. In order to provide a conservative air quality analysis, the project-specific thresholds recommended in the revised 2017 CEQA Guidelines (BAAQMD, 2017) will be used in the current air quality impacts analysis (see Table 2-2).

TABLE 2-2

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

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NO _x	54	10
PM ₁₀	82	15
PM _{2.5}	54	10

*Source: BAAQMD, 2017

Discussion of Impacts

III a. The proposed rule amendments are not expected to conflict with or obstruct implementation of the applicable air quality plan. The applicable air quality plan is the Air District's recently-adopted 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. The Plan outlines the overall strategy for achieving the Bay Area's clean air goals by reducing emissions of ozone precursors, particulate matter, and other pollutants in the region.

Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15). The proposed amendments will not conflict with or obstruct implementation of the 2017 Clean Air Plan, rather it will help achieve the Plan's goals by helping to better implement some of the Air District's existing rules. Thus, no significant impacts to the implementation of the 2017 Clean Air Plan are expected.

III b – d. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. Changing monitoring frequency as proposed in amendments to Rule 11-10 would not result in an increase in actual emissions because the amendments are consistent with how the Rule has been implemented since adoption. However, the change in monitoring frequency, when

compared to the rule language as adopted, can theoretically allow for an emissions impact since less frequent monitoring may allow a future leak to go undetected for a longer period of time.

The Air District's position is that a theoretical impact relative to the rule language that was never implemented does not require analysis under CEQA. However, for the sake of transparency and thoroughness, the Air District is analyzing these theoretical impacts so that the public understands the difference between the rule as it was adopted (though not implemented) and the rule as it would be amended.

Rule 11-10 as adopted in December 2015 required daily monitoring of cooling towers for leaks, while the currently proposed amendments to Rule 11-10 would require weekly monitoring with potential adjustments to bi-monthly monitoring. Approval of Rule 11-10 in December 2015 was based on estimated reduction of hydrocarbon emissions from 978 tons per year to 117 tons per year (a reduction in 861 tons per year). This estimate was based on available emissions factors for un-monitored cooling towers and emissions factors for cooling towers that are monitored monthly. The daily or continuous monitoring requirements for cooling towers larger than 2,500 gpm (Rule 11-10 as adopted) are more stringent than monthly monitoring. While the proposed amendments for weekly monitoring are less stringent than daily monitoring, both monitoring requirements remain substantially more stringent than monthly monitoring.

The weekly monitoring proposed for Rule 11-10, as compared to the daily monitoring in the rule as adopted, equates to a potentially longer period of time before a leak is detected under specific circumstances, and subsequently delay minimization and/or repair of a leak resulting in increased ROG emissions (i.e. "foregone" emission reductions). The theoretical foregone emission reductions have been initially estimated to be approximately 16 tons per year¹ and could exceed the ROG significance criteria. These theoretical air quality impacts associated with the ROG emissions will be evaluated in the Draft EIR.

CEQA Guidelines indicate that cumulative impacts of a Project shall be discussed when the Project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065(c). The cumulative air quality impacts of the proposed Project will also be evaluated in the Draft EIR.

III e. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15). The proposed amendments are not expected to result in an increase in any emissions at refineries, including odorous emissions. The proposed amendments to Rule 11-10 could result in theoretical foregone ROG emission reductions; however, cooling towers are generally not sources of odors because leaks start out small, are diluted with a high volume of cooling water, and further diluted by a high volume of air flowing up through the cooling tower. Therefore, the proposed rule amendments are not expected to result in an increase in the emissions that could generate odors. The Air District will continue to enforce odor nuisance complaints through District Regulation 7, Odorous Substances.

¹ Described in Appendix 1 of the Refinery Rules – Draft Amendments Workshop Report

Conclusion

The currently proposed amendments would not require the construction of any additional equipment or refinery modifications. However, changing monitoring requirements for cooling towers as proposed in the amendments to Rule 11-10 from daily to weekly equates to a theoretical increase in the time that it would take for a leak to be detected and subsequently delay the minimization and/or repair of the leak, resulting in increased ROG emissions above the currently approved Rule 11-10 (emission reductions “forgone.”) The theoretical emission reductions foregone could exceed the ROG significance criteria and 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
IV. BIOLOGICAL RESOURCES. Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The Air District 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 Bay Area supports numerous distinct natural communities composed of a diversity of vegetative types that provide habitat for a wide variety of plant and wildlife species. Broad habitat categories in the region include grasslands, coastal scrubs and chaparral, woodlands and forests, riparian systems and freshwater aquatic habitat, and wetlands. Extensive aquatic resources are provided by the San Francisco Bay Delta estuary, as well as numerous other rivers and streams. Urban and otherwise highly disturbed habitats, such as agricultural fields, also provide natural functions and values as wildlife habitat (ABAG, 2017).

The proposed rule amendments would affect the five refineries within the Bay Area. Petroleum refineries are generally located in industrial areas where native vegetation has been removed from the operating portions of the refinery to minimize the potential for 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. EPA regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

Significance Criteria

The proposed Project impacts on biological resources will be considered significant if:

- The Project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The Project interferes substantially with the movement of any resident or migratory wildlife species.
- The Project adversely affects aquatic communities through construction or operation of the Project.

Discussion of Impacts

IV a – f. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

Vegetation has been removed from the operating portions of refineries to minimize the potential for fire hazards. Since the proposed amendments to Rules 6-5, 11-10, and 12-15 are not expected to result in physical modifications to the existing refineries, they are not expected to result in impacts to biological resources and would not directly or indirectly affect riparian habitat, federally protected wetlands, or migratory corridors.

The proposed rule amendments would not conflict with local policies or ordinances protecting biological resources, nor would they conflict with local, regional, or state conservation plans because as the proposed Project applies to equipment in existing developed refineries. The proposed Project will also not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan as these types of conservation plans are not located within existing refineries.

Conclusion

Based upon the above considerations, significant adverse impacts to biological resources are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
V. CULTURAL RESOURCES. 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 Air District 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. Cultural resources also include paleontological sites, which can consist of mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains that are more than 5,000 years old and occur mainly in Pleistocene or older sedimentary rock units.

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.

Important vertebrate and invertebrate fossils and unique geologic units have been documented throughout California. The fossil yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks. Pleistocene or older (older than 11,000 years) continental sedimentary deposits are considered to have a high paleontological potential while Holocene-age deposits (less than 10,000 years old) are generally considered to have a low

paleontological potential because they are geologically immature and are unlikely to contain fossilized remains of organisms. Metamorphic and igneous rocks have a low paleontological potential, either because they formed beneath the surface of the earth (such as granite), or because they have been altered under heat and high pressures.

Historic resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529-1822) through the late 1960s are generally considered for protection if they are determined to be historically or architecturally significant. These may include missions, historic ranch lands, and structures from the Gold Rush and the region's early industrial era. More recent architectural sites may also be considered for protection if they could gain historic significance in the future (ABAG, 2017).

Of the 8,199 sites recorded in the Bay Area, there are 1,006 cultural resources listed on the California Register of Historic Resources (CRHR), meaning that they are significant at the local, State or federal level; of those, 744 are also listed on the National Register of Historic Places (NRHP). From this list, 249 resources are listed as California Historic Landmarks. The greatest concentration of historic resources listed on both the NRHP and the CRHR in the Bay Area occurs in San Francisco, with 181 resources. Alameda County has the second highest number with 147 resources (ABAG, 2017).

The petroleum refineries are located within industrial areas in the Bay Area. These areas have generally already been graded to accommodate development. Cultural resources would not be expected to be impacted by modifications to existing refineries.

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).

Significance Criteria

The proposed Project impacts to cultural resources will be considered significant if:

- The Project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed Project.
- The Project would disturb human remains.

Discussion of Impacts

V a – d. Rules 6-5, 11-10, and 12-15 were part of the District’s focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

Refinery structures are typically not considered to be historic resources. Therefore, no impacts to historical resources are expected as a result of the proposed Project, since no structures would be required to be removed. No construction activities are expected to be required as part of the proposed Project; therefore, no impacts to cultural resources, including archaeological resources, paleontological resources, or disturbance of human remains would occur as a result of the proposed Project.

Conclusion

Based upon the above considerations, significant adverse impacts to cultural resources are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
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 known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

California has 11 natural geologic regions, known as geomorphic provinces, which are defined by the presence of similar physical characteristics, such as relief, landforms, and geology. Most of the Bay Area is located in the natural region of California known as the Coast Ranges geomorphic province, with the eastern portions of Contra Costa and Alameda Counties extending into the neighboring Great Valley geomorphic province, located east of the Coast Ranges. The Coast Range, extends about 400 miles from Oregon south into Southern California, and is characterized by a series of northwest trending ridges and valleys that roughly parallel the San Andreas fault zone. The San Francisco Bay is a broad, shallow regional structural depression created from an east-west expansion between the San Andreas and the Hayward fault systems.

Much of the Coast Range province is composed of marine sedimentary and volcanic rocks located east of the San Andreas Fault. The region west of the San Andreas Fault is underlain by a mass of basement rock that is composed of mainly marine sandstone and various metamorphic rocks. Marginal lands surrounding San Francisco Bay consist generally of alluvial plains of low relief that slope gently towards the bay from bordering uplands and foothills (ABAG, 2017). 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 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 tectonic plate boundary marked by the San Andreas 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). The San Andreas and the Hayward faults are the two faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. These two faults are classified as strike-slip faults that have experienced movement within the last 150 years. Other principal faults capable of producing significant ground shaking in the Bay Area are included in Table 2-3, and include the Rodgers Creek-Healdsburg, Concord-Green Valley, Marsh Creek-Greenville, San Gregorio-Hosgri, West Napa and Calaveras faults (ABAG, 2017). A major seismic event on any of these active faults could cause significant ground shaking and surface fault rupture. 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.

TABLE 2-3

Active Faults in the Bay Area

Fault	Date of Last Movement	Maximum Moment Magnitude Earthquake
San Andreas	1989	7.9
Hayward	1868	7.1
Rodgers Creek-Healdsburg	1969	7.0
Concord-Green Valley	1955	6.9
Marsh Creek-Greenville	1980	6.9
San Gregorio-Hosgri	Late Quaternary	7.3
West Napa	2000	6.5
Maacama	Holocene	7.1
Calaveras	1990	6.8
Mount Diablo Thrust	Quaternary	6.7

(Source: ABAG, 2017)

A summary of the existing geological hazards in the vicinity of the existing 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 Southampton 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 Southampton 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 Southampton 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.

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 reviewing procedures that will reduce losses from ground failure during future earthquakes.

Significance Criteria

The proposed Project impacts on the geological environment will be considered significant if:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed Project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.

- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion of Impacts

VI a. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

The proposed rule amendments would not require any new construction, development, or refinery modifications. New structures must be designed to comply with the California Building Code requirements since the Bay Area is located in a seismically active area. The local cities or counties are responsible for assuring that any new or remodeled structures comply with the California Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage.

No significant impacts from seismic hazards are expected since no new equipment or structures would be required to comply with the proposed rule amendments. As a result, exposure of people or structures to the risk of loss, injury, or death involving seismic-related activities is not anticipated as a result of compliance with the proposed rule amendments. Therefore, no significant adverse impacts on geology and soils are expected.

VI b – d. The proposed rule amendments would affect existing refineries. However, no additional construction activities or physical modifications to the refineries would be required to comply with the proposed amendments. The proposed amendments would not require additional construction activities and, therefore, would not result in additional grading or other construction activities that could result in soil erosion or the loss of topsoil. Further, no construction activities would be required so no additional landslide, lateral spreading, subsidence, liquefaction or collapse impacts or development on expansive soils would occur due to the proposed rule amendments.

VI e. The proposed rule amendments would have no effect on the installation of septic tanks or alternative wastewater disposal systems. Refineries operate existing wastewater treatment systems

and the proposed rule amendments would result in no impacts to their existing wastewater treatment systems or require alternative wastewater treatment systems. Consequently, no impacts from failures of septic systems related to soils incapable of supporting such systems are anticipated.

Conclusion

Based upon the above considerations, significant adverse impacts to geology and soils are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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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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 type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" 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"/> |

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 climate change is caused primarily by an increase in levels of greenhouse gases (GHGs) in the atmosphere. The major greenhouse gases are the so-called “Kyoto Six” gases – carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs) – as well as black carbon.² These greenhouse gases absorb longwave radiant energy (heat) reflected by the earth, which warms the atmosphere in a phenomenon known as the “greenhouse effect.” The potential effects of global climate change include rising surface temperatures, loss in snow pack, sea level rise, ocean acidification, more extreme heat days per year, and more drought years.

Increases in the combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) since the beginning of the industrial revolution have resulted in a significant increase in atmospheric levels of greenhouse gases. CO₂ levels have increased from long-term historical levels of around 280 ppm before the mid-18th century to over 400 ppm today. This increase in greenhouse gases has already caused noticeable changes in the climate. The average global temperature has risen by approximately 1.4°F (0.8°C) over the past one hundred years, and 16 of the 17 hottest years in recorded history have occurred since 2001, according to the National Oceanic and Atmospheric Administration.

Total global greenhouse gas emissions contributing to climate change are in the tens of billions of metric tons of CO₂e (carbon dioxide equivalent) per year. The State of California alone produces about two percent of the entire world’s GHG emissions with major emitting sources including fossil fuel consumption from transportation (37 percent), electricity production (20 percent), industry (24 percent), agricultural and forestry (8 percent), residential activities (6 percent), and

² Technically, black carbon is not a gas but is made up of solid particulates or aerosols. It is included in the discussion of greenhouse gas emissions because, like true greenhouse gases, it is an important contributor to global climate change.

commercial activities (5 percent) (ABAG, 2017). The Bay Area's contribution to the global total is approximately 85 million tons per year. Transportation sources generate approximately 40 percent of the total, with the remaining 60 percent coming from stationary and area sources (BAAQMD, 2017).

Regulatory Background

California has committed to reducing its greenhouse gas emissions to 1990 levels by 2020, to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. This commitment was enacted in AB 32, the Global Warming Solutions Act of 2006, which adopted the 2020 target; in 2016's SB 32 (Pavley), which adopted the 2030 target; and in Executive Order S-3-05, which adopted the 2050 target. The Air District has adopted the same 80 percent reduction target for 2050 for the Bay Area's greenhouse gas emissions, in Board of Directors Resolution 2013-11.

To achieve these emission reduction goals, the California legislature has directed the California Air Resources Board (CARB) to develop a Scoping Plan setting forth regulatory measures that CARB will implement, along with other measures, to reduce the state's greenhouse gas emissions. One of the principal regulatory measures is CARB's Cap and Trade program, which requires industrial greenhouse gas sources to obtain "allowances" equal to their greenhouse gas emissions. The amount of available allowances is subject to a "cap" on total emissions statewide, which CARB will reduce each year. Regulated facilities will either have to reduce their emissions or purchase allowances on the open market, which will give them a financial incentive to reduce emissions and will ensure that total annual emissions from the industrial sector will not exceed the declining statewide cap.

California has also adopted the "Renewable Portfolio Standard" for electric power generation, which requires that at least 33 percent of the state's electric power must come from renewable sources by 2020, and at least 50 percent must come from renewables by 2030. To complement these efforts on electricity generation, the state has also committed to increasing the energy efficiency of existing buildings by 50 percent by 2050 in order to reduce energy demand.

California has adopted regulatory measures aimed at reducing greenhouse gas emissions from mobile sources. These measures include standards for motor vehicle emissions and the state's Low Carbon Fuel Standard, which set limits on the carbon intensity of transportation fuels. California has also adopted SB 375, the Sustainable Communities and Climate Protection Act of 2008, which requires regional transportation and land use planning agencies to develop coordinated plans, called "Sustainable Communities Strategies," to reduce greenhouse gas emissions from the transportation sector by promoting denser development and alternatives to driving. The current Sustainable Communities Strategy for the Bay Area is *Plan Bay Area 2040*, which was adopted by the Metropolitan Transportation Commission and the Association of Bay Area Governments in July of 2017.

The Air District has committed to reducing the Bay Area's regional greenhouse gas emissions to 80 percent below 1990 levels by 2050, as noted above. The Air District has also committed to a broad suite of specific measures to address greenhouse gases in the 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. That document lays out the Air District's vision for what the Bay Area

may look like in a post-carbon year 2050 and describes policies and actions that the region needs to take in the near- to mid-term to achieve these goals.

Significance Criteria

The most recently available Air District draft CEQA guidelines established GHG thresholds for specific Projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants.

The Air District draft CEQA Guidelines (BAAQMD, 2017) established a GHG threshold for air quality plans of “no net increase in emissions,” which is appropriate for air quality plans because they include a mix of control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The Project-level GHG threshold for stationary source Projects is 10,000 metric tons of carbon dioxide equivalent (CO₂e) emissions under the draft CEQA Guidelines. This threshold is expected to capture approximately 95 percent of all GHG emissions from new permit applications from stationary sources within the jurisdiction of the Air District. The threshold level was calculated as an average of the combined CO₂ emissions from all stationary source permit applications submitted to the Air District during the three-year analysis period (BAAQMD, 2017). The interim Project-level GHG significance threshold of 10,000 MT CO₂e will be used to evaluate the cumulative GHG impacts.

Discussion of Impacts

VII a and b. Combustion of conventional hydrocarbon fuel results in the release of energy as bonds between carbon and hydrogen are broken and reformed with oxygen to create water vapor and carbon dioxide (CO₂). CO₂ is not a pollutant that occurs in relatively low concentrations as a by-product of the combustion process; CO₂ is a necessary combustion product of any fuel containing carbon. Therefore, attempts to reduce emissions of greenhouse gases from combustion focus on increasing energy efficiency – consuming less fuel to provide the same useful energy output.

The analysis of GHG emissions is a different analysis than for criteria pollutants for the following reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is typically based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects to human health, e.g., one-hour and eight-hour. Using the half-life of CO₂, 100 years, for example, the effects of GHGs are longer-term, affecting the global climate over a relatively long-time frame. GHGs do not have human health effects like criteria pollutants. Rather, it is the 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. Furthermore, the GHG emissions associated with the proposed rule amendments would be small relative to total global or even state-wide GHG emissions. Thus, the significance of potential impacts from GHG emissions related to the proposed Project has been analyzed for long-term operations on a cumulative basis, as discussed below.

Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction, require additional energy or fuel, or generate GHG emissions.

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. All refineries in the Bay Area are subject to the requirements of the AB 32 Cap-and-Trade Program and have a GHG allocation based on current GHG emissions levels. The AB 32 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. Therefore, the refineries are subject to a plan to reduce GHG emissions. The proposed rule amendments would not require any additional equipment, construction, fuel or energy use; therefore, they would not result in any increase in GHG emissions.

Conclusion

Based upon the above considerations, significant adverse GHG impacts are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the Project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the Project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The Air District covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses.

Facilities and operations within the District handle and process substantial quantities of flammable materials and acutely toxic substances. 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 come into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

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

Significance Criteria

The proposed Project impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Discussion of Impacts

VIII a and b. 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: (1) toxic gas clouds; (2) torch fires, flash fires, pool fires, and vapor cloud explosions; (3) thermal radiation; and (4) explosion/overpressure. The potential for these types of events to occur currently exists at the existing refineries.

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring requirements (Rule 11-10), and clarify reporting requirements (Rule 12-15). The proposed rule amendments would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. Ammonia is currently used to reduce NOx emissions at existing refineries. Rule 6-5 limited ammonia emissions from FCCUs. To comply, refineries were required to optimize the injection of ammonia or urea. Rule 6-5 did not increase the use of ammonia or urea and likely resulted in a decrease in ammonia use. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications.

Changing monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction, require the use of additional hazardous materials, generate additional hazardous materials or create new refinery hazards. Therefore, no increased hazards are expected from implementation of the proposed rule amendments.

VIII c. The proposed rule amendments would not generate hazardous emissions, handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. Rule 6-5 limited ammonia emissions from FCCUs and resulted in a decrease in ammonia emissions. (Note that ammonia is regulated as a TAC). Proposed amendments to Rules 11-10 and 12-15 are not expected to result in an increase in TAC emissions from refineries. Therefore, no increase in TAC emissions is expected from implementation of the proposed rule amendments.

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. Implementation of the proposed rule amendments would not interfere with site cleanup activities or create additional site contamination. As a result, the proposed Project is not expected to require any physical modifications to facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.

VIII e and f. The proposed rule amendments would not result in a safety hazard for people residing or working within two miles of a public airport or air strip. No impacts on airports or airport land use plans are anticipated from the proposed rule amendments which would apply to petroleum refineries operating in the Bay Area, which are generally not located near public airports or air strips. No construction activities or additional refinery structures are required due to the proposed rule amendments. 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 and amended rules that would apply to existing petroleum refineries. The refineries affected by the proposed rule amendments already exist and operate within the confines of existing industrial facilities. The proposed rule amendments do not require construction activities or new structures that would impact any emergency response plan. The existing refineries affected by the proposed rule amendments already use, produce, store and transport hazardous materials, so emergency response plans already include hazards associated with existing refinery operations. The proposed rule amendments would not 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 rule amendments. The petroleum refineries affected by the proposed rule amendments already exist and operate within the confines of existing industrial areas. Native vegetation has been removed

from the operating portions of the affected refineries to minimize fire hazards. The proposed rule amendments would not increase the risk of hazards associated with wildland fires in general and specifically in areas with flammable materials. Therefore, the proposed Project would not expose people or structures to significant risk of loss, injury or death involving wildland fires.

Conclusion

Based upon the above considerations, significant adverse hazards and hazardous materials impacts are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
IX. HYDROLOGY AND WATER QUALITY.				
Would the Project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- j) Inundation by seiche, tsunami, or mudflow?

Setting

The Air District 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). Reservoirs and drainage streams are located throughout the area within the District’s jurisdiction, and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of California. Water from the Sacramento and San Joaquin Rivers of the Central Valley flow into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate strait. The Delta is a large triangle of interconnected sloughs and agricultural “islands” that forms a key link in California’s water delivery system. Some of the fresh water flows through the Delta and into Bay, but much is diverted from the Bay for agricultural, residential, and industrial purposes, as well as delivery to distant cities of southern California as part of state and federal water projects (ABAG, 2017).

The two major drainages, the Sacramento and San Joaquin Rivers receive more than 90 percent of runoff 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 of which seven border the Bay. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. 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 (ABAG 2017).

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 Bridge 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 (ABAG, 2017).

The Bay Area region is divided into a total of 28 groundwater basins. The ten primary groundwater basins in the Bay Area are the Petaluma Valley, Napa-Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, Sunol Valley, and Santa Clara Valley basins. Groundwater in the region 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 (ABAG, 2017).

Together, surface water and ground water supply approximately 31 percent of Bay Area water. Surface water from local rivers and streams (including the Delta) is an important source for all Bay Area Water agencies, but particularly in the North Bay counties, where access to imported water is more limited because of infrastructure limitations. The greatest proportion of Bay Area water is imported from Sierra Nevada and Delta sources, comprising approximately 66 percent of supply. The primary Sierra Nevada sources are the Mokelumne River and Tuolumne River watersheds. Several Bay Area water agencies receive Delta water through the State and Central Valley Water Projects, which comprise a vast network of canals and aqueducts for the delivery of water throughout the Bay Area and the Central Valley (ABAG, 2017).

Recycled water in the Bay Area has come to be widely used for a number of applications, including landscape irrigation, agricultural uses, commercial and industrial purposes and as a supply to the area's wetlands. The Alameda County Water District operates the Newark Desalination Facility which supplies approximately 12.5 million gallons per day to the distribution system (ABAG, 2017).

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatment systems. Some treatment plants serve individual cities while others serve multiple jurisdictions. More than 50 agencies provide wastewater treatment throughout the Bay Area. Most industrial facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of National Pollutant Discharge Elimination System (NPDES) permits.

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 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 Regional Water Quality Control Board administers the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

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

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

Significance Criteria

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 263,000 gallons per day of potable water.

Water Quality:

- The Project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The Project will cause the degradation of surface water substantially affecting current or future uses.
- The Project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the Project.
- The Project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The Project results in alterations to the course or flow of floodwaters.

Discussion of Impacts

IX a and f. No increase in wastewater discharge is expected from the proposed Project so no impacts on water quality resources are anticipated from the proposed Project. The proposed Project is not expected to require any new construction or development. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed rule amendments would not require any new construction or development. Changing monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, require the use of additional water or result in additional wastewater discharges from the affected refineries. Therefore, the proposed rule amendments would not result in the violation of any water quality standards or waste discharge requirements.

IX b. No increase in water use is expected as a result of the proposed rule amendments. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the monitoring requirements (Rule 11-10), and clarify reporting requirements (Rule 12-15). The proposed rule amendments would not require any new construction or development. Changing monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, require the use of additional water from the affected refineries. Therefore, the proposed Project would not deplete groundwater supplies or interfere with groundwater recharge.

IX c – e. The proposed Project does not have the potential to increase the area subject to runoff since no construction activities, new development or new structures are expected to occur. In addition, storm water drainage within refineries has been controlled and no construction activities are expected, therefore, storm water drainage within the existing refineries would not be altered. Therefore, the proposed rule amendments would not 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 Project is 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 as a result of the proposed Project.

IX g – j. The proposed Projects do not include the construction of new or relocation of existing housing or any other 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”). No new construction is associated with the proposed Project at refineries. 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.

Conclusion

Based upon the above considerations, significant adverse impacts to hydrology and water quality are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
X. LAND USE AND PLANNING. 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 Air District 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 land uses surrounding the Bay margins tend to be more intensely developed, particularly from San Francisco south along the Peninsula to Santa Clara County, and Contra Costa County south through Alameda County to Santa Clara County. These areas also include extensive networks of open space. The counties north of the Bay (Marin, Sonoma, and Napa) are more sparsely developed with a combination of suburban development, smaller cities and towns, and agriculture defining the landscape. Other areas of the Bay Area, such as the East Bay and Solano County, tend to be more suburban in character, with heavy industry related to oil refineries dotting the landscape as well as agriculture (ABAG, 2017).

Approximately 18 percent of the region's 4.8 million acres are considered to be urban or built-up land according to the California Farmland Mapping and Monitoring Program. The remaining undeveloped area includes open space and agricultural lands as well as water bodies and parks. Approximately 29 percent of the region is identified as protected open space. The Bay Area includes 101 cities with San Jose, San Francisco, and Oakland representing the largest urbanized centers (ABAG, 2017).

Regulatory Background

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

Significance Criteria

The proposed Project impacts will be considered significant on land use and planning if the Project conflicts with the land use and zoning designations established by local jurisdictions, or any applicable habitat conservation or natural community conservation plan.

Discussion of Impacts

X a – c. Rules 6-5, 11-10, and 12-15 were part of the District’s focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new construction, or new development. Thus, the proposed rule amendments do not include any components that would mandate physically dividing an established community or generate additional development.

All of the General Plan and land use plans for Richmond, Martinez, and Rodeo (Contra Costa County) and Benicia (Solano 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 (Richmond, 2015).
 - **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 (Martinez, 2015).
 - **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 (Benicia, 2015).
- **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 (CCC, 2015).
- **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 proposed rule amendments would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the Project. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The proposed Project has no components which would affect land use plans, policies, or regulations as no new development or refinery modifications would be expected. Habitat conservation or natural community conservation plans, agricultural resources or operations, would not be affected by the proposed Project, and divisions of existing communities would not occur. Therefore, current or planned land uses within the District will not be affected as a result of the proposed rule amendments.

Conclusion

Based upon the above considerations, significant adverse impacts to land use and planning are not expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
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"/>

Setting

The Air District 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 Project are located in a Contra Costa and Solano Counties in 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.

Significance Criteria

The proposed Project impacts on mineral resources will be considered significant if:

- The Project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The proposed Project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion of Impacts

XI a and b. The proposed rule amendments are not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15). The proposed Project would not require any new construction or development. Thus, the proposed rule amendments are not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Therefore, no impacts on mineral resources are expected.

Conclusion

Based upon the above considerations, no significant adverse impacts to mineral resources are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
XII. NOISE. Would the Project:				
a) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Expose persons to or generate of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) 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 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 and expose people residing or working in the Project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The Air District 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 Project are located in Contra Costa and Solano Counties in the Bay Area.

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.

Significance Criteria

The proposed Project impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise ordinance is currently exceeded, Project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary.
- The proposed Project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, Project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion of Impacts

XII a, c, and d. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. No new major industrial equipment is expected to be required to be installed due to the proposed Project so that no noise impacts associated with the operation of the proposed Project are expected. Further, the refineries are regulated by local noise ordinances. Therefore, refinery operations affected by the proposed rule amendments are not expected to result in a significant adverse effect on local noise control laws or ordinances.

XII b. The proposed Projects are not expected to generate or expose people to excessive groundborne vibration or groundborne noise. No construction equipment or activities that would generate vibration (e.g., backhoes, graders, jackhammers, etc.) is required to comply with the proposed rule amendments and no modifications to refinery equipment are required. Therefore, the proposed Project is not expected to generate excessive groundborne vibration or noise.

XII e and f. If applicable, the petroleum refineries affected by the proposed rule amendments 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. The proposed new and amended regulations 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 increase ambient noise levels, either intermittently or permanently.

Conclusion

Based upon the above considerations, no significant adverse noise impacts are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
XIII. POPULATION AND HOUSING. 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 Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The proposed amendments would apply to refineries located within Contra Costa and Solano Counties in the Bay Area.

Population in the Bay Area in 2015 was about 7.6 million people, which is approximately 20 percent of California’s population. The population of the Bay Area is expected to grow to about 9.6 million people by 2040. Approximately 4 million people in the Bay Area were employed in 2015, and that number is expected to grow to 4.7 million jobs by 2040. There were approximately 2.8 million households in the Bay Area in 2015, and the number of households is expected to increase to 3.4 million by 2040 (ABAG, 2017).

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.

Significance Criteria

The proposed Project impacts on population and housing will be considered significant if:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed Project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion of Impacts

XIII a. According to the Association of Bay Area Governments (ABAG), population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). 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 new and amended regulations will affect five refineries in Contra Costa and Solano counties. It is not expected that the affected refineries would need to hire additional personnel to implement the proposed rule amendments and no construction is expected to be required. Additional labor was required to monitor fugitive equipment under Rule 11-10; however, the proposed amendments Rule 11-10 will reduce the frequency of monitoring required for cooling towers. As such, adopting the proposed rule amendments are not expected to induce population growth.

XIII b and c. The proposed rule amendments would require modifications to existing refineries so that they 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, population and housing impacts would not occur from the implementation of the proposed rule amendments.

Conclusion

Based upon the above considerations, no significant adverse impacts to population and housing are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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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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"/>

Setting

The Air District 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.

Public services are provided by a wide variety of local agencies. Fire protection services are managed at the local level, typically by municipalities, counties, fire protection districts, or volunteer fire companies. California Government Code §38611 states that any city organized under general law must establish a fire department unless it is included within the boundaries of an established fire protection district. State and federal lands are generally served by State and federal fire agencies, e.g., CALFIRE and National Park Service. In some cases, businesses and native Tribes manage their own fire departments. Each fire protection agency is responsible for serving its own prescribed area, but mutual aid agreements are in wide use across the region such that agencies can rely on assistance from neighboring agencies in the case of overwhelming demand (ABAG, 2017).

Police services are provided on the State, county, and local levels. Police services provide law enforcement in crime prevention, traffic and congestion control, safety management, emergency response, and homeland security. The California Highway Patrol (CHP) is responsible for police protection along the interstate highway systems and provides services for traffic management, emergency response, and protection of the highway system. Each county in the Bay Area has its own sheriff's department responsible for police protection in unincorporated areas of each county. Each incorporated city and town has a police department responsible for police protection within its own jurisdiction. Unincorporated areas and individual cities and towns also may contract with county sheriff departments for police services instead of providing their own (ABAG, 2017).

Although the California public school system is under the policy direction of the Legislature, the California Department of Education relies on local control for the management of school districts. School district governing boards and district administrators allocate resources among the schools of the district and set education priorities for their schools. Each jurisdiction in the Bay Area provides residents with local public education facilities and services, including elementary, middle, secondary, and post-secondary schools, as well as special and adult education. As of 2015-2016 school year, there were 2,018 public and charter schools in the Bay Area with 1,019,853 enrolled students and 51,702 teachers (ABAG, 2017).

Public facilities within the Air District are managed by different county, city, and special-use districts. All refineries maintain fire-fighting equipment and trained personnel with fire-fighting and emergency response experience. In addition, all affected refineries maintain on-site security personnel and systems that include fences and enclosures, as well as 24-hour guarded entrances to their facilities.

Regulatory Background

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

Significance Criteria

The proposed Project impacts on public services will be considered significant if the Project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion of Impacts

XIV a. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction.

As stated above, all refineries maintain on-site fire-fighting equipment and trained personnel with fire-fighting and emergency response experience. Refineries also maintain their own security

systems, including fencing and controlled access at manned gates. The proposed rule amendments would not require the construction or operation of any additional refinery equipment. Therefore, the proposed Project is not expected to increase the need or demand for additional services from local fire or police departments above current levels.

As noted in the “Population and Housing” discussion above, the proposed rule amendments are not expected to induce population growth because no increase in employment is expected to be required. Therefore, there will be no increase in local population and thus no impacts are expected to local schools, parks, or other government services.

Conclusion

Based upon the above considerations, no significant adverse impacts to public services are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
XV. RECREATION. Would the Project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The Air District covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. The Bay Area contains approximately 1.3 million acres of parks and open space areas, with Santa Clara County having the most (about 19%) followed by Sonoma County (17%), and Marin County (16%). Approximately 265,000 acres of new parkland were added to the regional’s open space inventory between 2002 and 2013, representing a 26 percent increase. Additionally, approximately 200,000 acres of privately-owned land are held in permanent reserve as of 2013. While access by the general public to these reserve areas is restricted, they are important for the preservation of wildlife habitats and the protection of the environment and rural characteristics of various parts of the region (ABAG, 2017).

Parks and open space are generally categorized according to their size and amenities. Smaller parks such as pocket parks, neighborhood parks, community parks, urban forests, and community gardens serve local communities, typically are located in urbanized areas, and often include a wide range of improvements from playing fields and picnic areas to playgrounds and fitness trails. These parks are most often managed by local park districts or municipalities, which typically set minimum standards for park acreage based on their population. Larger open space areas such as regional parks, greenbelts, trails and pathways, natural and wildlife preserves, state parks and federal parks serve a broader geographic range, typically are located outside of major urbanized areas, and generally include fewer improvements. Management of these parks is divided among a range of organizations and agencies including regional park districts, State and federal government, private individuals, and non-profit land trusts.

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.

Significance Criteria

The proposed Project impacts on recreation will be considered significant if:

- The Project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The Project adversely affects existing recreational opportunities.

Discussion of Impacts

XV a – b. As discussed under “Land Use” above, there are no provisions in the proposed new and amended regulations affecting 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 rule amendments. The proposed rule amendments would not increase or redistribute population and, therefore, would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities. Therefore, adoption of the proposed Project is not expected to have any significant adverse impacts on recreation.

Conclusion

Based upon the above considerations, no significant adverse impacts to recreation are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
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 by 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 Air District 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. Transportation systems located within the Bay Area include railroads, airports, waterways, and highways.

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. These facilities provide access to major employment centers and to destinations outside of the Bay Area. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing localized access to individual communities. Together, these roadway facilities accommodate nearly 158 million vehicle miles each weekday. The road network also serves over 600,000 vehicles that travel into or out of the region from adjacent areas. Over half of these interregional travelers use two regional gateways: Interstate 80 connecting Solano County and Yolo County, and Interstate 580 and Interstate 205 connecting Alameda County and San Joaquin County (ABAG, 2017).

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.

There are over 11,500 transit route miles of service including heavy rail (BART), light rail (Muni Metro and Santa Clara Valley Transportation Authority or VTA Light Rail), commuter rail (Caltrain and Alameda Commuter Express or ACE), diesel and electric buses, cable cars, and ferries. This public transit system accommodates a total of almost 1.7 million passengers a day, with about 53 percent of daily passengers on Muni Metro, about 26 percent of daily passengers on BART, 11 percent on AC Transit, and nine percent on VTA. Amtrak provides long-distance passenger rail services to the Bay Area via the Capitol Corridor, San Joaquin, Coast Starlight, and California Zephyr lines (ABAG, 2017).

In addition to public transit systems and operators, private transit options have been increasing including privately-operated commuter shuttles (e.g., Apple and Google), publicly accessible private shuttles (e.g., Emery Go-Round and Chariot), and transportation network companies (e.g., Uber and Lyft) (ABAG, 2017).

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 65 percent in 2015. The portion of commuters that carpool was about 10 percent in 2015, while an additional 12 percent utilize public transit. About two percent of commuters walked to work in 2015. In addition, other modes of travel (bicycle, motorcycle, etc.), account for five percent of commuters in 2015 (ABAG, 2017).

The Bay Area is served by five seaports, which provide the opportunity for intermodal transfers to truck and railcars. The Port of Oakland is the third largest U.S. seaport on the West Coast (after the Ports of Long Beach and Los Angeles). Other seaports include the Port of San Francisco, the Port of Richmond, the Port of Benicia, and the Port of Redwood City. These seaports are supported by freight railroad services operated by Union Pacific and Burlington Northern Santa Fe.

The Bay Area is also served by three international airports: San Francisco International Airport, Oakland International Airport, and Norman Y. Mineta San Jose International Airport. Each of these airports provides mobility for people and freight nationally and internationally. The region is also served by one smaller airport with limited commercial service, Charles M. Schulz Sonoma County Airport, as well as numerous small general aviation airports.

Regulatory Background

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

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

Significance Criteria

The proposed Project impacts on transportation and traffic will be considered significant if:

- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

Discussion of Impacts

XVI a, b, and f. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Projects would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. It is not expected that the affected refineries would need to hire additional personnel to implement the proposed rule amendments and no construction is expected to be required. Additional labor was required to monitor fugitive equipment under Rule 11-10; however, the proposed amendments Rule 11-10 will reduce the frequency of monitoring required for cooling towers. As such, adopting the proposed rule amendments is not expected to require any new employees or generate additional truck traffic associated with equipment/material delivery.

The proposed rule amendments would not affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways are expected. No changes are expected to parking capacity at or in the vicinity of affected refineries as the proposed Project would not require additional employees. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

XVI c. The proposed rule amendments are not expected to involve the delivery of materials via air so no increase in air traffic is expected.

XVI d and e. The proposed Project is not expected to increase traffic hazards or create incompatible uses. No effect on emergency access to affected refineries would occur from adopting the proposed rule amendments as traffic is not expected to increase. The proposed Project is not expected to have a significant adverse impact on traffic hazards, create incompatible uses or emergency access.

XVI f. The proposed rule amendments affect existing refineries and would not conflict with adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, bicycle racks) as no increase in employees or other traffic is expected.

Conclusion

Based upon the above considerations, no significant adverse impacts to transportation and traffic are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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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XVII. TRIBAL CULTURAL RESOURCES.

Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Setting

The Air District 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. Tribal cultural resources include site features, places, cultural landscapes and sacred places or objects which are of cultural value to a Tribe. The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. Dense concentrations of Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. In addition, archaeological sites have also been identified in the following environmental settings in all Bay Area counties: near water sources, such as vernal pools and springs; along ridgetops and on midslope terraces; and at the base of hills and on alluvial flats. Native American archaeological sites have also been identified in the inland valleys of all Bay Area counties. Remains associated with a Native American archaeological site may include chert or obsidian flakes, projective points, mortars and pestles, and dark friable soil contain shell and bone dietary debris, heat-affected rock, or human burials (ABAG, 2017).

Native American populations, identified by their language, that lived within the Bay Area, included Costanoan, Eastern Miwok, Patwin, Coast Miwok, Pomo, and Wappo. Native villages and campsites were inhabited on a temporary basis and are found in several ecological niches due to the seasonal nature of their subsistence base. Remains of these early populations indicate that main villages, seldom more than 1,000 residents, were usually established along water courses and drainages. By the late 1760s, about 300,000 Native Americans lived in California (ABAG, 2013).

Regulatory Background

The State CEQA Guidelines were amended in July 2015 to include evaluation of impacts on tribal cultural resources. Tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe (Public Resources Code §21074).

Significance Criteria

The proposed Project impacts to tribal resources will be considered significant if:

- The Project results in the disturbance of a significant prehistoric or historic archaeological site or a property of Tribal cultural significance to a community or ethnic or social group or a California Native American Tribe.
- Unique objects with cultural value to a California Native American Tribe are present that could be disturbed by construction of the proposed Project.

Discussion of Impacts

XVII a and b. As discussed in Section V, Cultural Resources, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The proposed amendment rules would only affect refineries and would not require the construction or operation or any additional refinery equipment. Affected refineries may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3), are not listed or eligible for listing in the California Register of Historic Resources or a local register of historical resources (Public Resources Code Section 5020.1(k), and are not considered to have cultural value to a California Native American Tribe.

Further, no construction activities are required to implement the proposed rule amendments at the refineries; therefore, no grading is required and the proposed Project would not require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. The proposed rule amendments would not result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources.

As part of releasing this CEQA document for public review and comment, the document is circulated to the State Clearinghouse that provides notice of the proposed Project to all California

Native American Tribes that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code § 21080.3.1(b)(1). The NAHC notification list provides a 30-day period during which Native American Tribes may respond to the notice, in writing, requesting consultation on the proposed rule amendments.

Since no construction activities are required, the proposed rule amendments would not affect historical or tribal resources as defined in Public Resources Section 5020.1(k), or 5024.1. Therefore, no impacts to tribal resources are anticipated to occur as a result of the proposed Project.

Conclusion

Based upon the above considerations, no significant adverse impacts to tribal cultural resources are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
XVIII. UTILITIES/SERVICE SYSTEMS. Would the Project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or would new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

Given the large area covered by the Air District, public utilities are provided by a wide variety of local agencies. The San Francisco Bay Hydrologic Region covers approximately 4,550 square miles and encompasses numerous individual watersheds that drain into the San Francisco Bay and directly into the Pacific Ocean. Water is supplied to affected refineries by water purveyors in the Bay Area, which include the Alameda County Water District, Contra Costa Water District, East Bay Municipal District, Marin Municipal Water District, Napa Water Department, San Francisco Public Utilities Commission, Santa Clara Valley Water District, Solano County Water Agency, Sonoma County Water Agency, and the Zone 7 Water Agency.

Solid waste includes the garbage, refuse and other discarded solid materials generated by residential, commercial, and industrial activities. Solid waste is handled through a variety of municipalities, through recycling activities and at disposal sites. The Bay Area is currently served by 16 privately operated landfills and one operated by the Sonoma County Public Works Department. The 16 landfills have a total remaining capacity of 261,889,000 cubic yards, or a total daily throughput of 41,804 tons per day (ABAG, 2017).

There are no hazardous waste disposal sites within the jurisdiction of the Air District. Hazardous waste generated at facilities, which is not recycled off-site, is required to be disposed of at a licensed hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California.

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.

Significance Criteria

The proposed Project impacts on utilities/service systems will be considered significant if:

- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the Project.
- An increase in demand for utilities impacts the current capacities of the electric utilities.
- The existing water supply does not have the capacity to meet the increased demands of the Project, or the Project would use a substantial amount of potable water.
- The Project increases demand for water by more than 263,000 gallons per day.
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion of Impacts

XVIII a, b, d, and e. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15).

The proposed Project would not require any new construction or development. Physical modifications associated with implementation of the original Rule 6-5 were limited to measures to optimize ammonia or urea injection systems on existing FCCUs. The currently proposed amendments to Rule 6-5 would not require the construction of any additional air pollution control equipment or refinery modifications. Changing the frequency of monitoring requirements (Rule

11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction. The refineries affected by the proposed new and amended rules already exist and already use water, generate wastewater, treat wastewater, and discharge wastewater under existing wastewater discharge permits. The proposed rule amendments would not require new equipment, result in an increase in water demand or an increase in wastewater discharge. As discussed in Hydrology and Water Quality (see Section IX a.), water use and wastewater impacts were determined to be less than significant.

XVIII c). Implementation of the proposed rule amendments would not require any new refinery equipment or modifications. Therefore, the proposed Project would not alter the existing drainage systems or require the construction of new storm water drainage facilities. Nor would the proposed amendments 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.

XVIII f and g. Implementation of the proposed rule amendments would not require any new refinery equipment or modifications. As such, the proposed Project is not expected to generate any increase in hazardous or solid waste. Therefore, no adverse impacts are expected to landfill capacity or compliance with federal, state and local statutes and regulations related to solid waste as a result of the proposed amendments.

The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15). Changing the frequency of monitoring requirements (Rule 11-10) or reporting requirements (Rule 12-15) would not result in any physical modifications, e.g., new equipment or construction, or require additional electricity, natural gas, refinery fuel gas, or any other type of fuel.

Conclusion

Based upon the above considerations, no significant adverse impacts to utilities and service systems are expected to occur due to the proposed amendments to Rules 6-5, 11-10 or 12-15 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
XIX. 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"/>

XIX. MANDATORY FINDINGS OF SIGNIFICANCE

Discussion of Impacts

XIX a. The proposed Project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the CEQA checklist.

The proposed Project would not require any new construction or development. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15). As discussed in Section IV - Biological Resources, Section V - Cultural Resources, and Section XVII – Tribal Cultural Resources, no significant adverse impacts are expected to biological, cultural resources, or tribal cultural resources.

XIX b and c. Rules 6-5, 11-10, and 12-15 were part of the District's focus on petroleum refinery emissions, designed to enhance reporting requirements and reduce emissions of PM, PM_{2.5}, ROG, NO_x, SO₂ and NH₃ from stationary sources located at petroleum refineries, thus providing a beneficial air quality impact and improvement in air quality. The proposed amendments would clarify exemptions (Rules 6-5 and 11-10), change the frequency of monitoring (Rule 11-10), and clarify reporting requirements (Rule 12-15) and are not expected to require additional refinery equipment, refinery modifications, development, or additional construction.

However, the proposed amendments to Rule 11-10 that would result in monitoring weekly may potentially delay the detection of a leak under specific circumstances, and subsequently delay minimization and/or repair of the leak resulting in increased ROG emissions above the currently approved Rule 11-10 (emission reductions "foregone."). The potential emission reductions foregone have been initially estimated to be approximately 16 tons per year and could exceed the ROG significance criteria. Therefore, the potential air quality impacts associated with the ROG emission impacts will be evaluated in the Draft EIR.

CEQA Guidelines indicate that cumulative impacts of a project shall be discussed when the project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065(c). The cumulative air quality impacts of the proposed Project will also be evaluated in the Draft EIR.

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CHAPTER 3

REFERENCES

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CHAPTER 3

References Cited

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**APPENDIX A
DRAFT AMENDMENTS TO REFINERY RULES PROJECT
COMMENT LETTERS RECEIVED ON THE NOP/IS**

The following are comments received on the NOP/IS for the Draft Amendments to Refinery Rules Project. The NOP/IS was circulated for a 30-day public review and comment period starting July 31, 2018 and ending September 8, 2018. In addition, the BAAQMD conducted a CEQA scoping meeting at the Air District Headquarters' Yerba Room on August 20, 2018 to take public comment on the proposed project.

The BAAQMD received two comment letters on the NOP/IS during the public review period and several comments at the public scoping meeting. The comments from the August 20, 2018 scoping meeting and the two comment letters that were received during the public comment period are provided below.

Memo

TO: Rule Dev Staff

Subject: Draft Amendments to Refinery Rules CEQA Initial Study – Scoping Meeting

Location: BAAQMD

Date: 8-20-2018

RE: Verbal Comments

Presentation provided by Guy Gimlen. No comments during presentation.

COMMENTS:

Attorney Keith Casto - Note: he is involved in the litigation – he has concerns paring of 12-15 with other rules – out of place with scoping session. Question to BAAQMD: What is your thinking of merging 12-15 with other ones?

Adan (BAAQMD) – 12 -15 is not merged. These refinery rules are proceeding on simultaneous tracks. They are proceeding simultaneously – per court oversight – rulemaking under administrative convenience – separate CEQA docs and separate rules and separate decisions – we (BAAQMD) want to avoid explicitly or implicitly that they are part of the same CEQA.

Shaw Lee (Chevron)– refinery ad hoc committee– will they be involved?

Victor (BAAQMD) – Yes we will present in front of ad hoc committee – date forthcoming.

Steven Yang (Chevron) – Do you show three diff types of calcs for the 16 TPY ROG from cooling towers in the staff report?

Guy (BAAQMD)– We do have a calculation in staff report on the 16 TPY – I just showed one calculation in Appendix A.

Steven Yang (Chevron) – Can you explain diff between the three calculations you mention for cooling towers? Now?

Guy (BAAQMD) – No not at this time. It will take some review of the methodologies used to provide that. Methods for estimating emission factors included in Staff Report, Appendix 4.

Guy (BAAQMD) – Any other Questions? Thank you very much for attending.

BY ELECTRONIC MAIL

16 August 2018

Jack Broadbent
Air Pollution Control Officer
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attention:

Air District Board members
Victor Douglas
Guy Gimlen

RECEIVED

AUG 16 2018

CLERK OF
THE BOARDS

350 Bay Area
350 Marin
350 San Francisco
All Positives Possible
Asian Pacific Environmental Network
Benicians for a Safe and Healthy Community
Center for Biological Diversity
Citizen Air Monitoring Network
Communities for a Better Environment
Community Science Institute
Crockett-Rodeo United to Defend the Environment
Fresh Air Vallejo
Friends of the Earth
Greenaction for Health and Environmental Justice
Idle No More SF Bay
Interfaith Climate Action Network of Contra Costa
Oakland Climate Action Coalition
Richmond Progressive Alliance
Sierra Club – San Francisco Bay Chapter
Stand.Earth
Sunflower Alliance
System Change not Climate Change – Bay Area
The Climate Mobilization
West Berkeley Alliance for Clean Air and Safe Jobs
West Marin Standing Together

Air District-Oil Refiners Agreement Threatening Maximum Feasible cPM (PM_{2.5}) and Sulfur Dioxide (SO₂) Emission Cuts from Fluid Catalytic Cracking (FCC); Notice of Preparation (NOP) and Initial Study (IS) on Rule 6-5 Amendments

Air Pollution Control Officer Broadbent,

By this letter our 25 organizations call on you to stop the deadly, unjust and needless pollution from fluid catalytic cracking (FCC) that remains unabated by proven least-emitting technology at the Chevron, Marathon (formerly Tesoro), and Shell refineries. We demand that the District:

Propose an amendment to Rule 6-5 that requires FCC emissions of condensable particulate matter (cPM; a type of PM_{2.5}) and sulfur dioxide (SO₂; a PM_{2.5} precursor) to be limited consistent with emission reductions that can be achieved by wet scrubbing.

Schedule a public hearing of the Board on Rule 6-5 to commence as soon as possible.

The NOP and IS reveal an agreement with three refiners you signed on 28 March 2017, but fail to mention that it commits you to propose and advocate changes to Rule 6-5 that could exempt refiners from using proven, least-emitting FCC wet scrubbing technology.

Fluid catalytic cracking (FCC) emits more PM_{2.5} than any other process in oil refining, which emits more PM_{2.5} than any other industry in your jurisdiction. Among other serious health impacts, PM_{2.5} causes 90% of premature deaths associated with air pollution and kills 2,000–3,000 Bay Area residents each year. This is based on the District's own data and estimates. Peer reviewed research and independent expert opinion confirm that impacts of refinery PM_{2.5} emissions are disparately severe in low-income communities of color near refineries.

continued

Jack Broadbent
16 August 2018
Page two

Proven technology can cut FCC emissions dramatically. FCC emission wet scrubbing is demonstrated in practice, notably at the Benicia refinery, where a wet scrubbing retrofit has operated for years. Publicly available District data on Benicia, Martinez, and Richmond FCC emissions suggest this proven technology can cut PM_{2.5} and SO₂ emissions from the Chevron, Marathon and Shell FCCs by as much as 99%. And by replacing higher-emitting electrostatic precipitators (ESPs), wet scrubbing can eliminate the explosion hazard of ESP sparking, preventing the recurrence of disasters like the 2015 Torrance FCC explosion. This proven, least-emitting, solution is *inherently* safer for refinery workers and communities.

The agreement you signed with oil refiners in March 2017 threatens to gut a requirement that could achieve this solution. It commits you to propose and advocate an approach to amending Rule 6-5 that considers removing any obligation to establish, enforce, or comply with cPM and SO₂ emission limits achievable by the least-emitting proven control technology. Without those limits, FCC wet scrubbing would not be required.

District staff has concealed this threat from the public, and apparently, from the State Air Resources Board. Instead of revealing the substantive amendments to Rule 6-5 your 2017 agreement contemplates, your NOP and IS characterize them as only clarifications of the rule's original intent. Meanwhile, environmental justice groups are informed that the Air District has assured the Air Resources Board it need not include FCC wet scrubbing in its AB 617 Blueprint because District implementation of this measure (supposedly) is on track.

Finally—because your agreement with refiners commits you to advocate a particular set of Rule 6-5 amendments regardless of evidence yet to emerge in any public hearing, and because this is the law—our representatives on the District Board must exercise independent judgement in their decision on this rule. Our requests of you, stated above, seek your cooperation in support of the Board's independent judgment. We believe the agreement does not preclude the actions we request, that its November 1st deadline now allows barely enough time for a Board hearing process, and that further delay would be unacceptable. Lives are at stake.

Laura Neish
 350 Bay Area

Richard Gray
 350 Marin

John Anderson
 350 San Francisco

Katherine Black
 Benicians for a Safe and Healthy Community

Hollin Kretzmann
 Center for Biological Diversity

Ken Szutu
 Citizen Air Monitoring Network

continued

Jack Broadbent
16 August 2018
Page three

Camille Stough
Communities for a Better Environment

Denny Larson
Community Science Institute

Nancy Reiser
Crockett-Rodeo United to Defend the Environment

Peter Brooks
Fresh Air Vallejo

Marcie Keever
Friends of the Earth

Bradley Angel
Greenaction for Health and Environmental Justice

Pennie Opal Plant
Idle No More SF Bay

Rev. Will McGarvey
Interfaith Climate Action Network of Contra Costa

Colin Miller
Oakland Climate Action Coalition

Jeff Kilbreth
Richmond Progressive Alliance

David McCoard
Sierra Club – San Francisco Bay Chapter

Matt Krogh
Stand.Earth

Steve Nadel
Sunflower Alliance

David F. Gassman
System Change not Climate Change – Bay Area

Armando Davila
The Climate Mobilization

Janice Schroeder
West Berkeley Alliance for Clean Air and Safe Jobs

W. Ellen Sweet
West Marin Standing Together

Miya Yoshitani
Asian Pacific Environmental Network

LaDonna Williams
All Positives Possible

August 8, 2018

Victor Douglas
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Also sent via e-mail: vdouglas@baaqmd.gov

RE: SCH# 2018082001, Amendments to Refinery Rules (6-5, 11-10, 12-15) Project; Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties, California

Dear Mr. Douglas:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for Draft Environmental Impact Report for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd. (a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a **separate category of cultural resources**, “tribal cultural resources” (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code § 21084.2). Please reference California Natural Resources Agency (2016) “Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form,” <http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf>. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends **lead agencies consult with all California Native American tribes** that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC’s recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
 - a. A brief description of the project.
 - b. The lead agency contact information.
 - c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
 - d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).
2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
 - a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).
3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
 - a. Alternatives to the project.
 - b. Recommended mitigation measures.
 - c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).
4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
 - a. Type of environmental review necessary.
 - b. Significance of the tribal cultural resources.
 - c. Significance of the project's impacts on tribal cultural resources.
 - d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).
5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).
6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
 - a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
 - b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. **Conclusion of Consultation:** Consultation with a tribe shall be considered concluded when either of the following occurs:
- a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
 - b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).
8. **Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document:** Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).
9. **Required Consideration of Feasible Mitigation:** If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).
10. **Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:**
- a. Avoidance and preservation of the resources in place, including, but not limited to:
 - i. Planning and construction to avoid the resources and protect the cultural and natural context.
 - ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
 - b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
 - i. Protecting the cultural character and integrity of the resource.
 - ii. Protecting the traditional use of the resource.
 - iii. Protecting the confidentiality of the resource.
 - c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
 - d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
 - e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
 - f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).
11. **Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource:** An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
- a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
 - b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
 - c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

This process should be documented in the Cultural Resources section of your environmental document.

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires **local governments** to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. **Tribal Consultation**: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. **No Statutory Time Limit on SB 18 Tribal Consultation**. There is no statutory time limit on SB 18 tribal consultation.
3. **Confidentiality**: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. **Conclusion of SB 18 Tribal Consultation**: Consultation should be concluded at the point in which:
 - a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
 - b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: <http://nahc.ca.gov/resources/forms/>

NAHC Recommendations for Cultural Resources Assessments

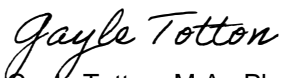
To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
 - a. If part or all of the APE has been previously surveyed for cultural resources.
 - b. If any known cultural resources have been already been recorded on or adjacent to the APE.
 - c. If the probability is low, moderate, or high that cultural resources are located in the APE.
 - d. If a survey is required to determine whether previously unrecorded cultural resources are present.
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
 - a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.

- b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.
- 3.** Contact the NAHC for:
 - a.** A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
 - b.** A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.
- 4.** Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
 - a.** Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
 - b.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
 - c.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

Please contact me if you need any additional information at gayle.totton@nahc.ca.gov.

Sincerely,



Gayle Totton, M.A., Ph.D.
Associate Governmental Program Analyst
(916) 373-3714

cc: State Clearinghouse