

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.



COMMUNITIES
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ENVIRONMENT

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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
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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
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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

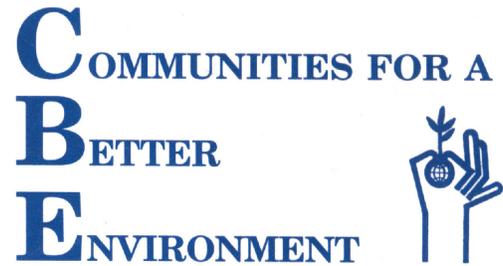
W. Ellen Sweet
West Marin Standing Together

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

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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.

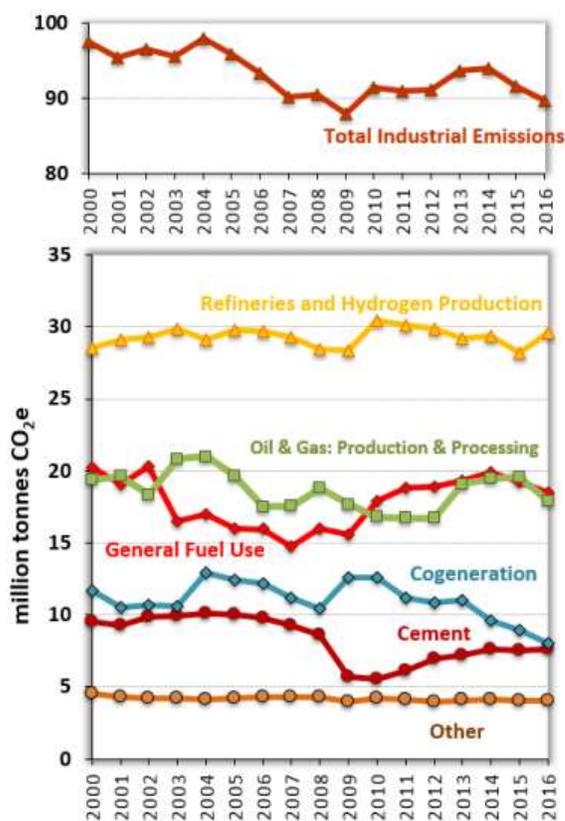
ADD RIGHT TO PETITION CARB TO CORRECT AQMD ERRORS -- a mechanism for public petition for a second-opinion review of emission inventories and permitting errors.

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](#) -- 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.



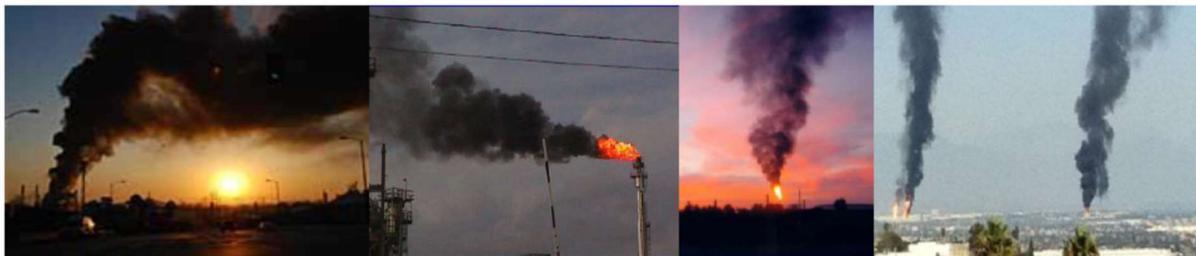
August 2016, Tesoro LA sulfur tank explosion.



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:

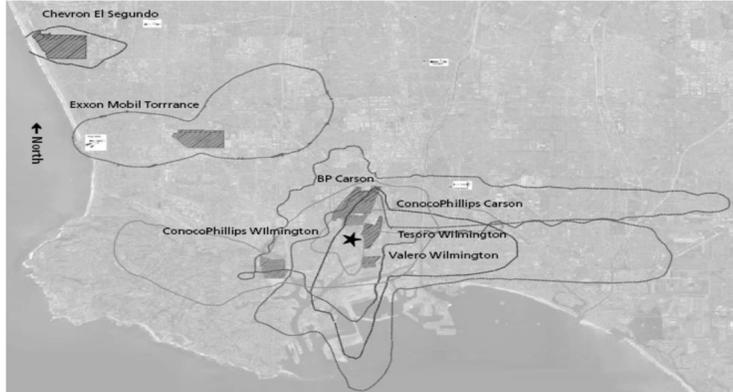
CBE members living here face some of the worst fossil fuel-impacts in the state. This community is over 90% people of color, with many children attending school within a mile of a refinery, and **five oil refineries within, or on, the city's borders. Major diesel trucking and the Ports of LA and Long 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:

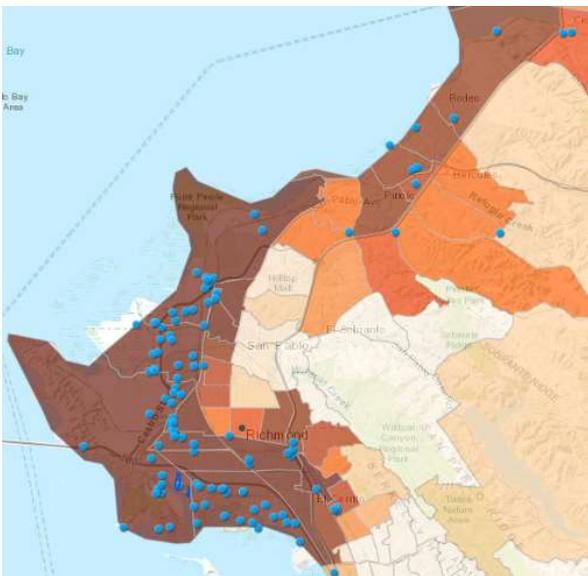
Richmond is home to the 2,900-acre Chevron Richmond Refinery, one of the largest stationary sources of greenhouse gas (GHG) emissions in California, the most egregious polluter in Richmond, and previously the largest refinery in California.

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.

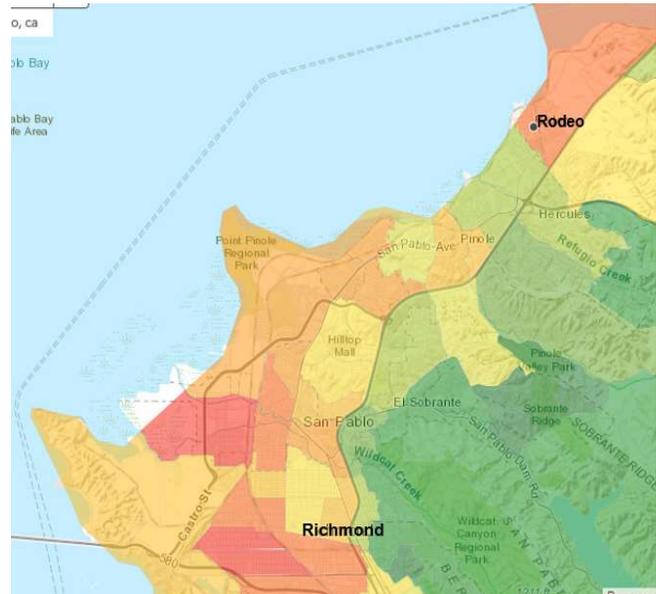
In addition to the major ongoing emissions and repeated explosions and fires at the refineries, CalEnviroScreen shows Richmond and Rodeo both at risk from very high asthma, diesel impacts, hazardous waste, and toxic chemical cleanup sites (Richmond is top 97th, Rodeo top 87th worst, mapped below).⁴



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=9d54eccc28264c2da6495d64ce053913>



[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

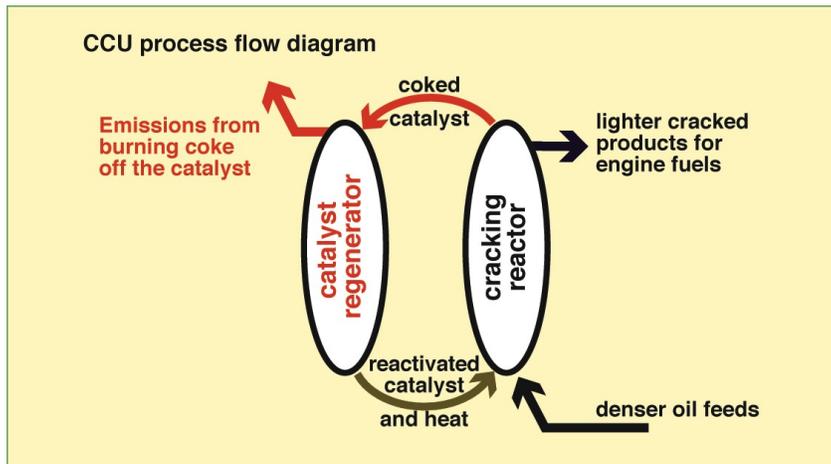
This would result in Tesoro's H-100 Heater at a limit of 72 lbs/day (302 MMBtu/hr x 0.01 lb/MMBTU = 3.02 lb/hr x 24 hrs)

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:

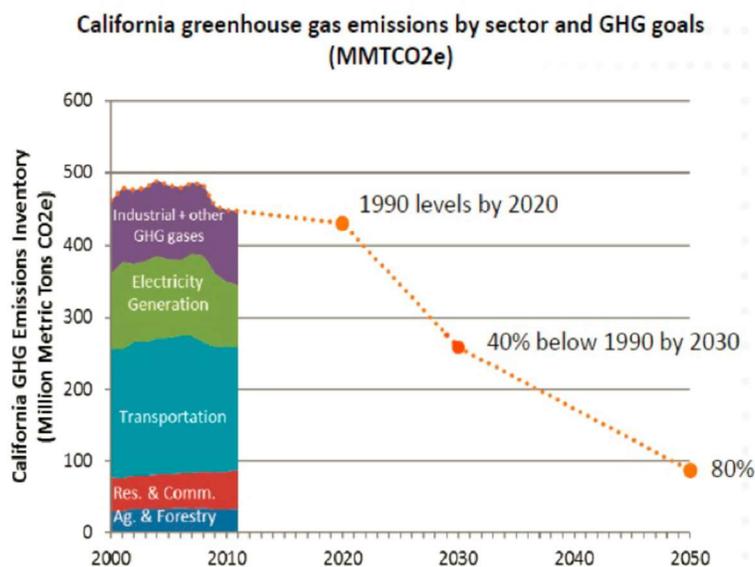
- California cannot meet urgent GHG, Smog, and Toxics goals without a phasedown Plan
- Start with a moratorium on refinery expansions,
- Also ban harmful pollution trading (such as PM2.5) within air basins that replaces emissions cuts and expansion limits

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*

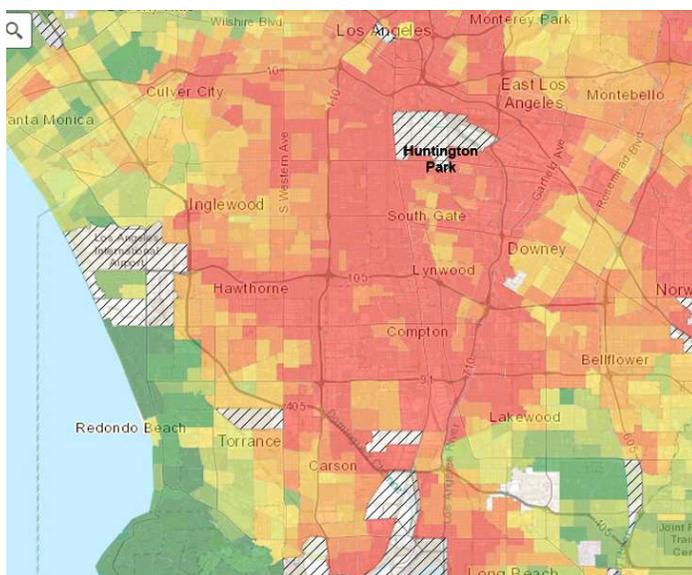
II. Many Areas of the State *without Oil Refineries* such as Southeast LA and East Oakland are severely cumulatively impacted by heavy transportation and smaller stationary sources

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.

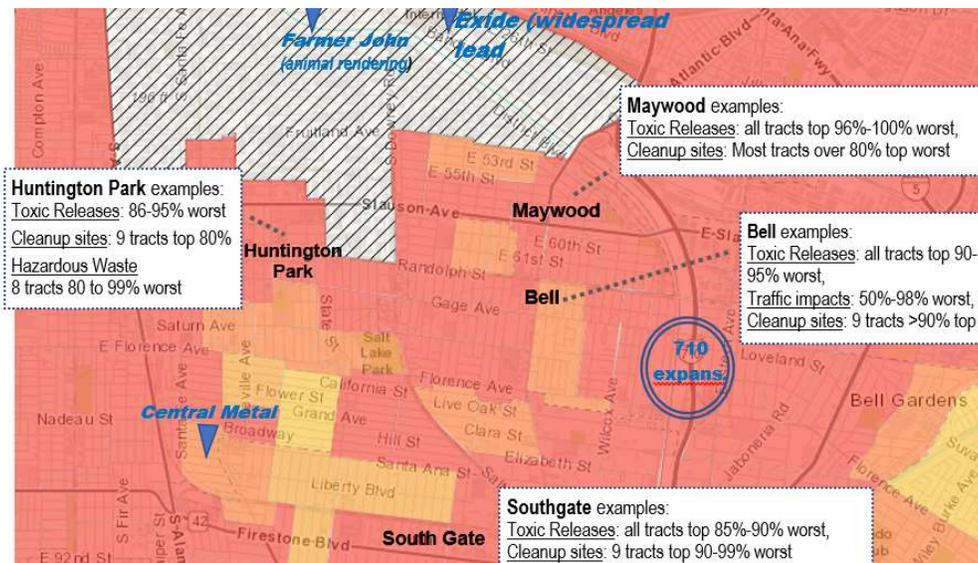
Cumulative Impacts include PM2.5, toxic releases, traffic, diesel, ground-level ozone (smog), cleanup sites, hazardous waste, plus educational, and economic disadvantages, and asthma, cardiovascular, and other health disadvantages. Most census tracts (48 out of 66) for CBE SELA members and partners, 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:

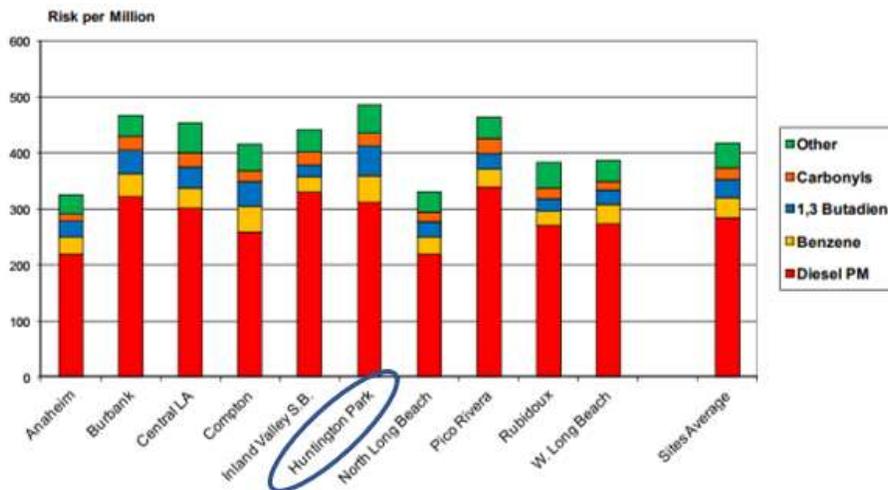
<https://oehha.maps.arcgis.com/apps/webappviewer/index.html?id=4560cfbce7c745c299b2d0cbb07044f5> and Census: [Social Characteristics 2010 Census](#) and [Economic Characteristics 2010 Census](#)

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

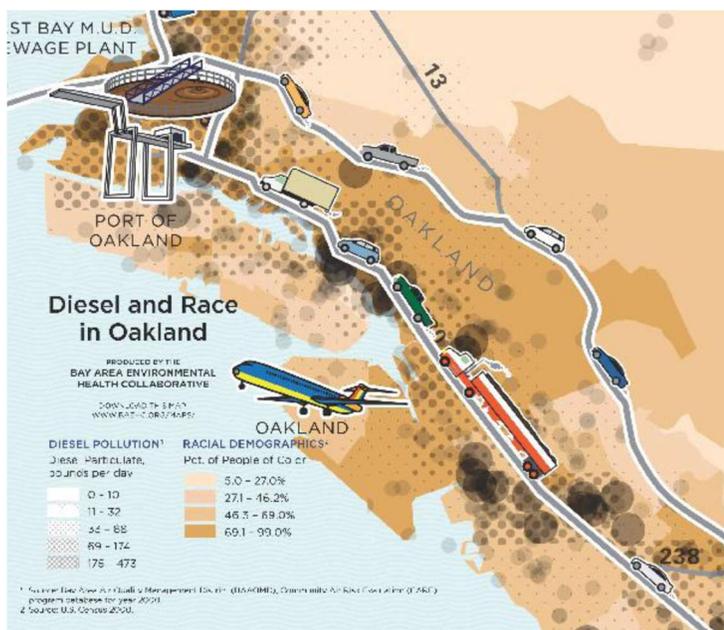
East Oakland's Hegenberger Corridor (roughly 1.5 miles by 0.8 miles) is a largely black and latino community in the heart of the Elmhurst neighborhood, with a history of industrial pollution, with heavy diesel, asthma, hazardous waste, and housing impacts.³⁷

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.

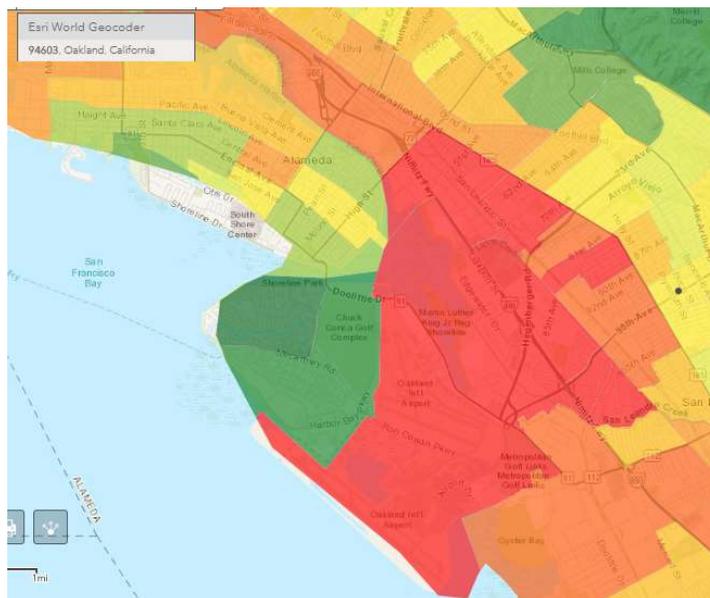
After World War II, the flight of the white middle-class and discriminatory practices by financial institutions contributed to disinvestment in East Oakland. The community is burdened by poor schools, inadequate health care and social services, and employment opportunities largely limited to low-paying 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 (OSHDP).)

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)

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 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, Thrutrol, 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, Polyoxylalkylenes, 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																					
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3">Regional</th> <th colspan="3"><2.5miles</th> </tr> <tr> <th></th> <th>Death</th> <th>Pop</th> <th>Rt.</th> <th>Death</th> <th>Pop</th> <th>Rt.</th> </tr> </thead> <tbody> <tr> <td>Adults >25 yr***</td> <td>42905</td> <td>5,144,345</td> <td>834.03</td> <td>751</td> <td>81,666</td> <td>918.992</td> </tr> </tbody> </table>														Regional			<2.5miles				Death	Pop	Rt.	Death	Pop	Rt.	Adults >25 yr***	42905	5,144,345	834.03	751	81,666	918.992
	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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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', written over a horizontal line.

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

Dear Mr. Joe,

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

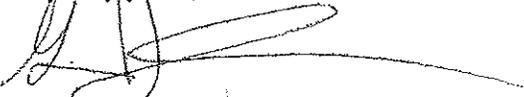
In summary, Shell has the following comments:

- **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