March 1st, 2021

COMMUNITIES FOR A BETTER ENVIRONMENT
established 1978

Members of the Stationary Source Committee
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Transmitted via email

Re: Communities for a Better Environment Comments on January 2021 BAAQMD Workshop Report on Draft Amendments to Regulation 6, Rule 5: Particulate Emissions from Petroleum Refinery Fluidized Catalytic Cracking Units

Communities for a Better Environment (CBE) appreciates the work of District staff in the development of amendments to BAAQMD Regulation 6, Rule 5 regarding Particulate Emissions from Petroleum Refinery Fluidized Catalytic Cracking Units (FCCUs), which has most recently been summarized in the January 2021 Workshop Report (WSR). CBE respectfully offers these comments on the WSR so that the report may be further revised. The purpose of these comments is first, to inform the Board of Directors about the incomplete and biased analysis that prejudices the stronger rule, and second, to reinforce CBE's recommendation to adopt Rule 6-5 Control Scenario B because it best meets the legislative mandate of Assembly Bill 617 (AB 617) to protect the health of communities already disproportionately devastated by air pollution.

I. Introduction.

First, CBE commends the District's publication of this WSR in the effort to provide essential context and a technical review for the public to understand this vitally important rule. For example, the modeling in the WSR painfully and effectively illustrates the ongoing environmental racism against Black and Latinx communities from their disproportionate exposure to the deadly particulate matter (PM) pollution billowing from Fluidized Catalytic Cracking Units or FCCUs. The WSR also importantly notes that FCCUs alone produce approximately 17% of the total PM across all District-permitted facilities in the entire Bay Area.[1] Such analysis provides insights into the critical importance of this rule and how it could fulfill the intentions of the AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Schedule Program to reduce harmful air emissions from stationary sources subject to California's Cap and Trade scheme in disproportionately impacted communities.

CBE urges District staff to maintain this level of detail throughout the WSR. As described below, some sections are lacking in or completely absent of the underlying analysis required to support its conclusions. One significant example is the high estimation of costs to install wet gas scrubber (WGS) technology under the stronger standard, Control Scenario B. The preliminary cost estimates are based upon an unverified statement from a single refinery, and the methodology presented is inadequate to reproduce the estimates. Without justification, this and several other

[1] David Joe, PE, and David Finkle, Workshop Report on Draft Amendments to Regulation 6, Rule 5: Particulate Emissions from Petroleum Refinery Fluidized Catalytic Cracking Units ("WSR"), Bay Area Air Quality Management District (Jan. 2021) at 8, https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-6-rule-5-particulate-emissions-from-refinery-fluidized-catalytic-cracking-units/2020-amendment/documents/20210127_wsr_0605-pdf.pdf?la=en

sections of the WSR make conclusions that skew towards the weaker control standard and thus threaten to undermine the credibility of this rulemaking process.

In the interest of transparency and fairness, District staff should show the work underpinning their analysis and estimates. CBE encourages the District to correct any errors promptly so that Members of the Board may be fully and fairly informed when deciding between the two pollution control standards presented.

II. Wet Gas Scrubber (WGS) Cost Estimates Appear Inflated and Insufficiently Supported.

CBE remains extremely concerned about the cost estimation methodology used for the WGS, which serves as the fundamental basis for any cost-benefit analysis. CBE asks for the District to explain the underlying assumptions and substantial limitations of the methodology used in much greater detail so the Board may make an informed decision. The District must be transparent about when the District flouts the EPA manual and the resulting uncertainty of the estimated cost data, so that the Board may appropriately weigh the cost data as a factor in selecting the final rule. Additionally, CBE requests that the District offer a new benchmark for the WGS cost estimates. At the very least, the cost analysis should reflect all cost information that has been collected across refineries, rather than relying on a single refinery.

The cost estimation methodology in the WSR has several compromised components. First, the WSR uses a US EPA cost estimation model, but given the context, inappropriately and inaccurately. The model was not intended for this type of cost estimate calculation. Although the model is a WGS cost estimate model, it was designed for much smaller pollution sources. The EPA manual for this model clearly states "The cost equations apply to industrial sources of PM10 and PM2.5 with air flow rates between 100 acfm and 200,000 acfm. Extrapolation to flow rates beyond those presented is not appropriate."[2] The WSR ignores the EPA manual and inappropriately proceeds to use this model as a basis to determine capital and annual WGS costs.

The WSR does make several standard adjustments for temporal, geographic, and market condition differences. These are judicious adjustments. However, the three refineries in the Bay Area are still substantially larger than the model's designed inputs. Bay Area refineries have exhaust flows greater than 480,000 actual cubic feet per minute (acfm), which is significantly above the manual recommendations. These standard adjustments did nothing to remedy the underlying incompatibility of the model.

The WSR does attempt to manually "right-size" this inappropriate model. The WSR simply applies a single multiplication factor to compensate for the size difference. However, the EPA model is non-linear so using a single multiplication factor risks significant inaccuracies. Additionally, the WSR uses a single refinery-reported cost figure. The WSR compares its cost estimate using the EPA model to a single cost estimate buried in a federal Congressional hearing transcript in 2013. During this hearing, a Valero executive stated, "we have spent approximately $525 million to build a

[2] Daniel Mussatti and Paula Hemmer, Section 2, Chapter 6 – Wet Scrubbers for Particulate Matter, EPA Air Pollution Control Cost Manual (Sixth Edition) (July, 15 2002) at 44, https://www.epa.gov/sites/production/files/2020-07/documents/cs6ch2.pdf.

state-of-the art flue-gas scrubber ... at our Benicia refinery in California."[3] It is unclear what types of costs were included in this unaudited, refinery-reported estimate. Yet based on this single figure and simple multiplication factor, the WSR ultimately concludes that the true cost of a WGS is a factor of seven higher than the EPA model estimates.

In general, District staff appear to have ignored cost estimates from equipment vendors, and instead report, without questioning or checking, cost estimates from the regulated refineries themselves. This goes against the advice of the EPA manual, which advises that cost estimates should ultimately be based on "a detailed engineering study and cost quotations from system suppliers."[4] The vendor cost estimates the District has already collected are well below the current proposed estimates. For example, in 2017, District staff used a vendor price quote to estimate that a non-regenerative scrubber for a FCCU with a 275,000 dscfm flow rate (the largest of the three affected refineries) would have an annual cost of $6M.[5] Now, District staff have inflated cost estimates to nearly $40M, as a result of a single, unverified cost estimate from a refinery.

Without clear justification, the WSR then proceeds to apply this seven-fold adjustment to all its cost estimates. CBE objects to the use of this single refinery-reported cost for the installation of the Valero Benicia refinery and the simplistic translation of the refinery-specific differential into a universal multiplier. This step in particular can be rectified.

In order to demonstrate the reasonableness of their skewed cost estimates, the WSR adds additional cost estimates found in various news articles and other refinery testimony. Yet most of these estimates are still refinery-reported figures that either aggregate costs across multiple WGS units or do not identify what itemized project costs are included. For example:

- The two data points for the Valero Delaware City costs appear to be based on an estimate from 2006 of $400 million for two scrubbers.[6] While vastly different in size, the WSR splits the cost equally between the two scrubbers.
- The cost for the scrubber at the Lemont refinery appears to be from a case filing for $140 million for an expansion project in 2013, "**most** of which costs are for the … wet gas scrubber."[7]

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[3] Senate Hearing 113-71 on Gas Prices: *Explore How U.S. Gasoline And Fuel Prices Are Being Affected By The Current Boom In Domestic Oil Production And The Restructuring Of The U.S. Refining Industry And Distribution System*; Hearings before the Senate Energy and Natural Resources, 113th Congress (July 16, 2013) (testimony of William R. Klesse), https://www.congress.gov/event/113th-congress/senate-event/LC739/text?s=1&r=1651.

[4] Daniel Mussatti and Paula Hemmer, Section 2, Chapter 6 – *Wet Scrubbers for Particulate Matter, EPA Air Pollution Control Cost Manual* (Sixth Edition) (July 15, 2002) at 44, https://www.epa.gov/sites/production/files/2020-07/documents/cs6ch2.pdf.

[5] Bay Area Air Quality Management District, *Staff Report on Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits* at 33 (March 2017), https://www.baaqmd.gov/~/media/files/planning-and-research/public-hearings/2017/12-16-staff-report-pdf.pdf?la=en.

[6] Bay Area Air Quality Management District, Engineering Evaluation for Tesoro Refining and Marketing: Company Plant No. 14628 and Banking Application No. 17798 (Dec. 15, 2008), https://www.baaqmd.gov/~/media/files/engineering/public-notices/2009/17798/b2758_nsr_17798_eval_010509.pdf

[7] Petition for Modification Of Variance To Include Additional Conditions For Protection Of Aquatic Life Uses, *In The Matter Of: Citgo Petroleum Corporation And Pdv Midwest Refining, L.L.C v. Illinois Environmental Protection Agency*, South Coast Air Quality Management District Permit Projects (July 10, 2013) at 15 (emphasis added),

Here, CBE recommends one methodological intervention. **The District should average the scaling factors for all the refineries reported in Table 7**, rather than using the cost estimates from Valero Benicia alone, to scale the EPA model results. CBE acknowledges the challenge of calculating cost estimates, so this proposal is one feasible improvement that could be made at this point in the rulemaking process.

CBE appreciates the effort to ground the cost estimates in an EPA model and additional data. However, we remain concerned that the WSR obscures the fact that the model, the methods, and the supplemental data are incongruous to the implementation of Rule 6-5. These limitations should be a significant factor in the Board's decision-making process.

III. The Control Scenario B Compliance Date Should be Moved Up to the Earliest Feasible.

The WSR recommends a compliance date for Control Scenario B of January 2026, yet a schedule much shorter than five years is possible. The WSR cites to the installation of a WGS at the Valero Benicia refinery, which was constructed between 2008 and 2010. However, the Valero Improvement Project was a vastly larger project than installing a WGS to control for solely FCCU emissions. Valero's WGS was also designed to control for both its coker and crude unit furnace. This suggests that a compliance schedule even shorter than Valero's three years is feasible.

Another example of a WGS installation project on an FCCU in California supports this conclusion. The installation of the WGS at the Phillips 66 (formerly ConocoPhillips) Los Angeles refinery, which was the first refinery in California to install a wet gas scrubber on an FCCU, only required a 15-month construction schedule. This schedule included the installation of both a WGS and a wet ESP between 2007 and 2008,[8] and was operational shortly thereafter.[9] Construction to comply with Control Scenario B is much more comparable to the ConocoPhillips Los Angeles refinery installation project than the massive Valero Improvement Project.

IV. The Water Usage Estimates for Control Scenario B Lack Proper Context and Are Inflated.

While there is reasonable concern that the implementation of a WGS will increase a facility's water usage, the additional water used compared to the existing water usage is minimal. For example, the Chevron Refinery used an average total average of 11.3 million gallons per day of water during the 2008 to 2010 period.[10] Using the District's current estimates, the expected WGS water consumption is only 1.1 - 3.8% of existing water consumption. For additional context, the North Richmond Water Reclamation Plant and the Richmond Advanced Recycled Expansion are both

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https://pcb.illinois.gov/documents/dsweb/Get/Document-80749/PCB%2014-4%2C071013%20Citgo%20PetnModfctnVar%20Etc.pdf.

[8] ConocoPhillips Los Angeles Refinery, *PM10 and NOx Reduction Projects, Chapter 2 – Project Description*, South Coast Air Quality Management District Permit Projects (2007) at 13, http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2007/conoco-phillips/ch2.pdf?sfvrsn=2

[9] ConocoPhillips, *2008 Annual Report: Managing Global Challenges*, https://static.conocophillips.com/files/resources/smid-394-ir-companyreports-ar-archive-2008-print.pdf.

[10] City of Richmond, *Chevron Refinery Modernization Project Environmental Impact Report*, http://www.ci.richmond.ca.us/DocumentCenter/View/45983/_Volume-1_Consolidated-Version?bidId=.

sources of recycled water for the Chevron refinery which, combined, can provide the refinery with 7.5 million gallons of water per day.[11]

Additionally, the water usage estimates cited in the report are based on much larger projects. The estimated upper limit of WGS water consumption of 430,000 gallons of water per day is based on the Phillips 66 Refinery in Los Angeles which employs both a wet gas scrubber and a wet electrostatic precipitator.[12] Meanwhile, the lower estimate of 120,000 gallons of water per day is based on the Valero WGS project which, as noted earlier, controls emissions from two additional sources.[13] Both these limits inappropriately represent the amount of water being used for only the WGS and should not be used as a reference limit nor as justification for the less stringent Control Scenario A.

V. The Final Rule Should Reflect the Legislative Mandate Created by the Expedited BARCT Schedule in Assembly Bill 617 (AB 617)

While the WSR includes a brief paragraph on the AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Schedule, there is still vitally important information missing on the history, purpose, and power of this standard. With this context, the Board will find Control Scenario B better aligns with the intent of the state legislature.

A. Best Available Retrofit Control Technology ("BARCT") Is a Technology-Forcing Standard Intended to Meet Environmental and Public Health Goals

AB 617[14] specifically mandated an expedited schedule of regulations intended to implement BARCT standard pollution controls in nonattainment zones like the Bay Area.[15] Under California Health & Safety Code § 40406, "best available retrofit control technology" is defined as an "emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." CBE recognizes the District has the reasonable discretion to weigh both the environmental health of residents and the cost to polluters. At the same time, California courts have further clarified the purpose and scope of the BARCT standard in a way that supports the adoption of Control Scenario B.

In 2012, the Supreme Court of California recognized BARCT as a "technology-forcing standard designed to compel the development of new technologies to meet public health goals."[16]

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[11] East Bay Municipal Utility District, *Recycled Water Projects*, https://www.ebmud.com/water/recycled-water/current-recycled-water-users/.

[12] BAAQMD, *Response to Comments for the Final Environmental Impact Report for the Bay Area Air Quality Management District: AB 617 Expedited BARCT Implementation Schedule Project,* https://www.baaqmd.gov/~/media/files/ab617-community-health/barct/20181214_feir_ab617_barct-pdf.pdf?la=en.

[13] City of Benicia, *Valero Improvement Project – Addendum to VIP EIR*, SCH No. 2002042122, at 284 (2-278) (June 2008). https://www.ci.benicia.ca.us/vertical/sites/%7BF991A639-AAED-4E1A-9735-86EA195E2C8D%7D/uploads/Valero_Improvement_Project_EIR_Addendum_ESA.PDF

[14] Assembly Bill 617, Garcia, C., Chapter 136, Statutes of 2017, modified the California Health & Safety Code, amending § 40920.6, § 42400, and § 42402, and adding § 39607.1, § 40920.8, § 42411, § 42705.5, and § 44391.2.

[15] Cal. Health & Saf. Code §§ 40920.6(b)-(c).

[16] *Am. Coatings Assn. v. S. Coast Air Quality Mgmt. Dist.*, 54 Cal. 4th 446, 465 (2012).

In other words, the Court ruled that a BARCT standard has the power to require air pollution control technology so strong it does not yet exist. Although both draft scenarios here merely involve existing technologies, the Court's interpretation of the BARCT standard in the context of its statutory scheme illuminates a legislative rationale to implement Control Scenario B. Unlike the Best Available Control Technology (BACT) standard, the BARCT standard is "expressly designed to force regulated sources to develop pollution control devices that might at the time appear to be economically or technologically infeasible."[17] In order to protect those living with the severe health burdens of living in a nonattainment zone, the BARCT standard is intended to reduce the barrier of economic costs of implementing strong emission limits.[18]

As the Supreme Court of California reasoned, polluters "generally ha[ve] insufficient incentive to develop or adopt new pollution control technology in the absence of regulation."[19] As AB 617 expedites the implementation of new air pollution control technology, BAAQMD holds significant power and responsibility to select the rule that best protects communities suffering the most.

B. AB 617 Creates a Legislative Mandate to Favor the Strongest Protections Against Toxic Air Contaminants and Criteria Air Pollutants for the Health of the Most Impacted Communities

AB 617, which mandated the expedited BARCT implementation schedule, is the companion bill to AB 398, an extension of California's cap-and-trade program.[20] These bills are connected in a few ways. The expedited BARCT schedule specifically applies to the regulation of industrial sources under the cap-and-trade program in nonattainment zones. AB 617 and AB 398 were primarily passed together, however, because industrial climate polluters can continue to pollute disproportionately in environmental justice communities.[21] AB 617 should be understood as an essential counterpart to AB 398, to address air pollution disparities aggressively so that the public at large can ostensibly benefit from an overall reduction in greenhouse gasses under the cap-and-trade program.

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[17] *Id.* at 465–66 (quoting *Union Electric Co. v. EPA* 427 U.S. 246, 256–257 (1976)).
[18] *See Id.*, 54 Cal. 4th 446, 468 (2012).
[19] *See Id.* at 466 (quoting *Sherwin–Williams Co. v. South Coast Air Quality Management Dist.*, supra, 86 Cal.App.4th at 1280, ["[A]ppellants cannot convince us that, left to itself, industry will take steps to safeguard the public health and public welfare by using less polluting but possibly more expensive technology."]; Fields & Fields, *Environmental Economics: An Introduction* (3d ed. 2002) 72–75 [unregulated markets generally do not provide adequate incentives to constrain external pollution costs]; Esty, *Revitalizing Environmental Federalism* (1996) 95 Mich. L.Rev. 570, 575–597 [same]).
[20] Officer of Governor Edmund G. Brown Jr., Governor Brown, *Senate President pro Tempore and Assembly Speaker Announce Landmark Legislation to Reduce Air and Carbon Pollution* (Jul. 10, 2017) https://www.ca.gov/archive/gov39/2017/07/10/news19870/index.html.
[21] California Environmental Justice Alliance News, *Justice Deferred: A Break Down of California's Cap & Trade Bill from the Environmental Justice Perspective* (Jul. 2017) https://caleja.org/2017/07/justice-deferred-a-break-down-of-californias-cap-trade-bill-from-the-environmental-justice-perspective/.

AB 617 and the California Air Resources Board (CARB)'s Community Air Protection Blueprint[22] to implement AB 617 focus on protecting the health of the most impacted communities, so BAAQMD should adopt the scenario that is most health-protective. The Community Air Protection Blueprint explains on Page 2:

> AB 617 is a significant step in transforming California's air quality programs to **address air pollution disparities** at the neighborhood level. It requires **new, community-focused** actions that go beyond existing State and regional programs to **reduce exposure to air pollution in disproportionately burdened communities** throughout the State, including statewide strategies and community-specific emissions reduction programs. The legislation also includes **additional requirements that work together to support emissions reductions in communities through: accelerated installation of pollution controls on industrial sources like oil refineries**, cement plants, and glass manufacturers; expanded air quality monitoring within communities; **increased penalties** for violations of emissions control limits; and greater transparency and improved public access to air quality and emissions data through enhanced online web tools.

The Blueprint continues to elaborate on transformative approaches to reducing pollution disparities, which include collaborating with impacted communities and increasing penalties on polluters under AB 617. In other words, the purpose of AB 617 and the acceleration of this rulemaking process is to reduce the negative health impact of exposure to air proportion in disproportionately burdened communities, even if it comes at additional cost to polluters. As the agency implementing AB 617, CBE urges the District to promulgate a new Rule 6-5 that meets the core purpose of AB 617.

VI. Conclusion

CBE again appreciates the opportunity to offer input on this landmark rule that has the potential to make significant improvements to the air quality of several Bay Area environmental justice communities. The revisions proposed and comments provided support CBE's recommendation of Control Scenario B. We look forward to reviewing the revisions, analysis, justifications, and other responses from the District to these comments and their integration into the administrative record. If you have questions, please contact CBE Staff Researcher Dan Sakaguchi at dan@cbecal.org.

Thank you for your consideration.

Sincerely,

Dan Sakaguchi, CBE Staff Researcher
Sharifa Taylor, CBE Staff Researcher

[22] California Air Resources Board, *Community Air Protection Blueprint* (Oct. 2018) https://ww2.arb.ca.gov/sites/default/files/2020-03/final_community_air_protection_blueprint_october_2018_acc.pdf.

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