Comment Letter #101

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Via e-mail at: AQMPteam@aqmd.gov

Re: WSPA Comments on SCAQMD Revised Draft 2022 Air Quality Management Plan

Dear Dr. Lee,

Western States Petroleum Association (WSPA) appreciates the opportunity to participate in the working group and workshops for the South Coast Air Quality Management District's (SCAQMD or District) 2022 Air Quality Management Plan (AQMP or Plan). The AQMP is a regional blueprint for achieving the national ambient air quality standards (NAAQS). On October 1, 2015, the U.S. Environmental Protection Agency (EPA) strengthened the National Ambient Air Quality Standards (NAAQS) for ground-level ozone, lowering the primary and secondary ozone standard levels to 70 parts per billion (ppb).[1] The 2022 AQMP is being developed to address the requirements for meeting this standard through proposed control measures.

WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport, and market petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies in five western states including California. WSPA has been an active participant in air quality planning issues for over 30 years. WSPA-member companies operate petroleum refineries and other facilities in the South Coast Air Basin (SCAB) that are regulated by the SCAQMD and will be impacted by the 2022 AQMP.

We understand the challenges that the District faces in attaining the NAAQS. The region's unique topography and meteorology combined with mobile source emissions continues to produce significant ozone pollution for which the District has limited control authority. And as cost-effective controls have been implemented, it has become increasingly difficult to identify and implement additional control measures that are cost-effective. On September 2, 2022, SCAQMD released the Revised Draft 2022 AQMP.[2] On October 1, 2022, SCAQMD released the Draft Socioeconomic Report for the Revised Draft 2022 AQMP.[3] WSPA offers the following comments.

[1] 2015 Revision to 2008 Ozone NAAQS. Available at: https://www.federalregister.gov/documents/2015/10/26/2015-26594/national-ambient-air-quality-standards-for-ozone.
[2] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.
[3] 2022 Draft AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

1. **SCAQMD should reaffirm their commitment to a technology and fuel neutral policy consistent with historical air quality management plan and rulemaking development.**

   In previous AQMPs and rulemakings, SCAQMD has taken a position of technology and fuel neutrality. In the 2016 AQMP, SCAQMD stated:[4]

   > *Air quality regulatory agencies have traditionally set policies and requirements that are performance-based, and thus technology- and fuel-neutral.* ***This is a policy that the SCAQMD intends to continue.*** *[Emphasis added]*

   To realize the emission reductions required by the 2022 AQMP, SCAQMD has stated that widespread deployment of zero emission (ZE) technology must be implemented over all sectors. The 2022 AQMP Policy Brief on Infrastructure and Energy Outlook states[5]:

   > *The only pathway to attainment requires widespread deployment of ZE technologies* at scale.

   However, by shifting to a singular technology/fuel approach, SCAQMD would limit the flexibility of industries and technology manufacturers to develop emission reduction strategies at lower costs. SCAQMD's objectives for air quality improvement would be further advanced by allowing competition among more technologies and fuels. SCAQMD's long-held technology neutral policy should be applied to the 2022 AQMP.

2. **The 2022 Draft AQMP includes numerous control measures which would require electrification of different types of equipment. California's electric grid infrastructure is already strained, and SCAQMD representatives have acknowledged the infrastructure will take years to develop. Yet the Draft AQMP does not consider the time or cost constraints electrification would impose. Before advancing such measures, SCAQMD should consider whether (or when) the region will be able to accommodate additional electric grid demands.**

   In the 2022 AQMP, electric technology options have been proposed for residential and commercial water heating, space heating, and cooking devices, as well as for non-emergency internal combustion engines, large turbines, electrical generation facilities, and petroleum refineries.[6] SCAQMD staff have acknowledged that the existing infrastructure is not sufficient for widespread adoption of ZE technologies and will take many years to develop.[7,8] SCAQMD also notes that the preliminary estimates of statewide ZE infrastructure needs developed by the California Energy Commission (CEC) and California Air Resources Board (CARB) "are largely based on a transition to ZE vehicles for on-road transportation sources, and do not fully address the adoption of ZE technologies by other emission sources, including stationary, locomotives, and off-road equipment."[9]

[4] SCAQMD Final 2016 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.
[5] 2022 AQMP Policy Brief on Infrastructure – Energy Outlook. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-infrastructure---energy-outlook.pdf?sfvrsn=8.
[6] 2022 AQMP Control Measures Workshop, Agenda Item 5, South Coast AQMDs Proposed Draft VOC Stationary Source and Other Measures, Slides 7-34. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/am-pres-agenda-item-5-nox-measures-110621.pdf?sfvrsn=6.
[7] 2022 AQMP Control Measures Workshop, Agenda Item 3, South Coast AQMDs Proposed Draft VOC Stationary Source and Other Measures, Slide 13. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/am-pres-agenda-item-3-zero-emission-technology-110621.pdf?sfvrsn=6
[8] August 2, 2021 letter to environmental organizations from Wayne Nastri, SCAQMD Executive Officer.
[9] SCAQMD 2022 AQMP Policy Brief, Infrastructure – Energy Outlook. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-infrastructure---energy-outlook.pdf?sfvrsn=8.

During a recent SCAQMD Legislative Committee meeting, Mayor Michael Cacciotti, Committee Chair and SCAQMD Governing Board Member, questioned whether the region in general, and certain utilities in particular, will be able to accommodate the new electric demands, and whether there is money being put into the updated grid.[10] In response, Wayne Nastri, SCAQMD Executive Officer, stated that California will need to build 7 gigawatts (GW) of power per year for the next 40 years to meet projected demand, and the most power California has built in a year thus far has been 1.2 GW. He stated that the question on everyone's mind is: If we have never met that level of increase in power, what makes us think we are going to be able to get the needed increases? Mr. Nastri continued, stating that it is going to be very difficult to get the required infrastructure we need to deploy to a fully zero-emission society.[11]

California faces significant and unresolved grid infrastructure and reliability concerns that would only be exacerbated by the electrification requirements in the proposed AQMP control measures. SCAQMD has not considered or analyzed any of the generation, transmission, or distribution constraints in its proposals. SCAQMD notes repeatedly in their responses to comments that control measure MOB-15, ZE Infrastructure for mobile sources, is a commitment to engage with stakeholders involved with the transition to ZE fueling with the goal of identifying potential shortfalls in technologies and energy availability while assisting in an effort to address these concerns.[12] However, assistance in planning does not provide a guarantee that the infrastructure will be in place to support the transition to ZE and near ZE technologies. SCAQMD must consider electrical infrastructure development and availability of reliable electrical power in the rulemaking process.

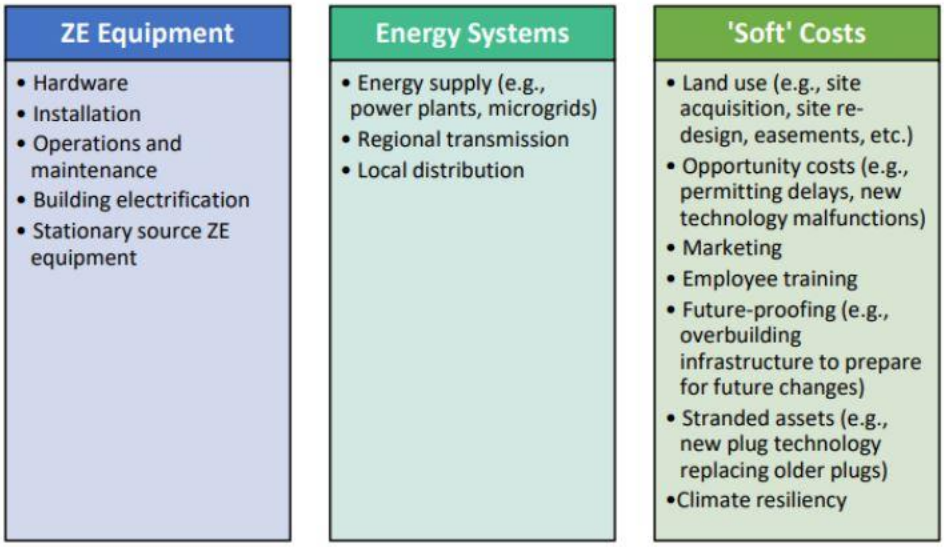
3. **The 2022 AQMP Draft Socioeconomic Report omits expenditures related to ZE infrastructure, making it an incomplete analysis of the impacts to residents in the South Coast Air Basin.**

The 2022 AQMP Draft Socioeconomic Report (Socioeconomic Report) states that the impact of implementing ZE and fuel-cell technologies on the existing infrastructure "presents challenges in quantifying cost and determining the level of uncertainty in scale and distribution."[13]

SCAQMD has stated that three categories of expenditures are expected for installation of future ZE infrastructure, as presented in Figure 1.[14]

[10] SCAQMD Legislative Committee Meeting, September 9, 2022. Meeting recording available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=1jo6esFRYug.
[11] Ibid.
[12] 2022 Revised Draft AQMP Comments and Responses to Comments. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[13] 2022 AQMP Draft Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.
[14] SCAQMD 2022 AQMP Draft Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

Figure 1: Three Categories of Costs for Zero Emissions Infrastructure.



The Socioeconomic Report notes the uncertainties in each of the above categories, stating that the level of uncertainty is the least for ZE equipment, and highest for soft costs, noting that:

> *…further research is needed to determine how these costs for each project can be considered broadly when zero emission technologies are deployed at the scale needed to meet air quality standards.*

SCAQMD further states that "'soft' costs are generally not included in current estimates." Additionally, the Socioeconomic Report states, "Due to high uncertainty, these speculative future energy system costs are not considered in the socioeconomic analysis…." But in fact, the scale of these costs is not impossible to estimate.

For example, a 2021 study of published literature on transportation electrification infrastructure costs in California estimated the cumulative costs from 2020-2050 for generation, transmission, distribution, maintenance, and electric vehicle chargers to achieve a statewide on-road zero emission vehicle (ZEV) fleet to be $2.1 to $3.3 trillion.[15] This cost estimate did not include:

- Infrastructure upgrade costs for generation, transmission, and supply of renewable hydrogen that is needed for operating fuel cell electric vehicles;
- Additional costs associated with upgrades to the electric grid to address grid reliability issues that could arise from increased use of renewables, public safety power shutoffs (PSPS) to avoid wildfires, and/or aging infrastructure;
- Potential stranded asset costs, if any, arising from policies implemented to achieve a statewide on-road ZEV fleet and zero-carbon electricity supply in 2050.

[15] Transportation Electrification Infrastructure Costs in California: A Meta-Study of Published Literature. Available at: https://www.arb.ca.gov/lists/com-attach/80-sp22-concepts-ws-AmNWJVA2VFgEM1Bn.pdf.

The above estimate was solely considering transportation electrification impacts and would not include costs for upgrading the grid for residential electrical use or other stationary source control measures as proposed in the 2022 Revised Draft AQMP. But this example suggests that those costs would be quite considerable. By failing to provide even planning-level costs for electrical infrastructure costs, the Socioeconomic Report vastly understates the cost of the Revised Draft AQMP.

SCAQMD should revise the cost analysis to include cost estimates for electrical infrastructure development and include them in the Socioeconomic Report.

4. **Implementation of the 2022 AQMP will be considerably more costly compared to the 2016 AQMP. This cost will be largely carried by residents of the SCAB. In addition, there are considerable job losses expected from implementation of the 2022 AQMP. As the District's costs and job loss estimates do not account for electrical infrastructure costs, those estimates are almost certainly understated.**

The 2016 AQMP proposed NOx reductions at an amortized cost of $0.85 billion, with over 90% of that cost attributed to publicly funded incentive programs.[16] Additionally, the net job impacts in the 2016 AQMP were between 9,000 jobs lost for a worst-case scenario and 29,000 jobs gained in a best-case scenario.

The Draft 2022 AQMP Socioeconomic Report states that the Revised Draft 2022 AQMP would be projected to result in an amortized cost of $2.85 billion more than business-as-usual (BAU); a cost that is 3.3 times higher than the 2016 AQMP. Costs are divided as follows:[17]

> *Nearly 57 percent or about $1.61 billion of the annual incremental cost is related to mobile source control strategies, and these strategies are expected to lead to about 80 percent of the emission reductions needed to attain the 8- hour ozone standard by 2037. The remaining 43 percent of the annual amortized average cost, or $1.24 billion, is associated with reducing stationary and area source emissions in the Basin which account for about 20 percent of the necessary emission reductions for regional air quality attainment.*

The Socioeconomic Report states that only 10% of the total incremental cost is attributed to incentive programs that can be used to offset the purchase of cleaner technologies. The large reduction in available incentives will likely result in costs being passed on to consumers.

The 2022 AQMP will also impact employment. The Socioeconomic Report defines Jobs Foregone as follows:

> *Jobs Foregone = Loss of Existing Jobs + Forecasted Jobs Not Created*

The Socioeconomic Report estimates between 17,000 - 29,000 jobs foregone annually, or a staggering 238,800 – 406,000 jobs foregone between 2023 and 2037.

As significant as that sounds, it is incomplete because the Socioeconomic Report does not consider costs related to necessary expansion of grid infrastructure. Governing Board

[16] SCAQMD 2016 AQMP Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/final/sociofinal_030817.pdf?sfvrsn=2.
[17] SCAQMD 2022 AQMP Draft Socioeconomic Report. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/draft-socioeconomic-report.pdf?sfvrsn=4.

Member Carlos Rodriguez recently noted that it is concerning that we do not have at least a planning level estimate for grid infrastructure development costs.[18]

Both the cost and job loss estimates presented in the Socioeconomic Report are incomplete and significantly understated. Even with these omissions, the cost and projected job loss figures are dramatically higher than the 2016 AQMP.

5. **The Revised Draft AQMP includes a health-based cost effectiveness threshold. The basis for this proposal is incomplete, and many of the assumptions are not well documented. Any threshold to consider societal health costs must also include all of the associated economic costs. This would need to include job losses, stranded asset costs, and any higher consumer prices.**

In the Revised Draft AQMP, SCAQMD has introduced a health-benefit cost-effectiveness threshold of $325,000/ton NOx-reduced. SCAQMD's analysis is based first on EPA's "Estimating the Benefit per Ton of Reducing Directly-Emitted $PM_{2.5}$, $PM_{2.5}$ Precursors, and Ozone Precursors from 21 Sectors".[19] This analysis relies on the Benefits Mapping and Analysis Program Community Edition (BenMAP-CE v.1.5) model to estimate the potential health impacts and economic values of impacts associated with the attributable ambient concentrations of primary $PM_{2.5}$, sulfate and nitrate $PM_{2.5}$, and ozone resulting from VOC or summer season NOx.[20] SCAQMD used the state level analysis for three industrial sectors to arrive at a benefits per ton of NOx estimates in California.[21]

Table 1: 2035 Benefits-Per-Ton of NOx Estimates in California (2021 Dollars)

Sector Name	NOx (tpy)	Short Term O_3 Exposure	Long Term O_3 Exposure	$PM_{2.5}$	Total
Boilers	5,706	$14,793	$119,972	$57,074	$191,839
ICE	4,121	$22,946	$180,540	$88,057	$291,543
EGU	9,403	$40,767	$313,325	$30,867	$384,959
Benefits-per-ton (weighted by tons reduced)					**$307,636**

[18] SCAQMD Governing Board Meeting, October 7, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=mQOlxYZ-Cm4.
[19] Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors, and Ozone Precursors from 21 Sectors. Available at: https://www.epa.gov/system/files/documents/2021-10/source-apportionment-tsd-oct-2021_0.pdf.
[20] BenMAP-CE. Available at: https://www.epa.gov/benmap.
[21] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.

SCAQMD states[22]:

> *As an additional check on this estimate based on EPA analysis, a comparison can be made with estimates from the 2016 AQMP and its associated Socioeconomic Impact Assessment… Based on these analyses, Option 2 would use a screening threshold of $325,000 per ton (2021 dollars) when evaluating the cost-effectiveness of proposed rules ($325,00 is the mid-point between the estimates from the 2016 AQMP and Table 4-16).*

The 2016 Socioeconomic Report also used BenMAP to assess health benefits associated with reductions in exposure to criteria pollutants. Therefore, the use of the 2016 Socioeconomic Report results really does not provide a true "check" on the EPA document, as the model used in the evaluation is the same.

Within this analysis the cost valuation of health effects prevented relies on willingness-to-pay (WTP) methodologies, however WTP estimates (current or historical) are not available for all included health endpoints. For that reason, the AQMP employs a mixed-methods approach which utilizes WTP estimates for some health endpoints, and cost-of-illness (COI) estimates for others – or occasionally both.

WTP and COI values are derived using very different techniques – WTP being based on querying of individuals on how much they would pay to avoid experiencing (or having their family members experience) given symptoms or illnesses. As such, WTP is dependent upon a wide variety of economic and behavioral individual perspectives and is adjusted in this analysis for income elasticity. In contrast, COI is measured by summing the costs incurred by the payer (typically an insurance company) for treating the given condition, including emergency room (ER) visits, in-patient hospital stays, outpatient hospital visits, prescriptions, etc. For some conditions, these quantities are summed over multiple years (e.g., Alzheimer's disease), whereas for other conditions the cost represents a single short-term health event (e.g., bronchitis).

In other locations within the documentation of the Revised Draft AQMP, COI is alternately defined as "lost work time due to absences from work to recover or take care of ill dependents."[23] Whereas the first definition for COI above represents direct costs, this second definition represents only *indirect* costs associated with productivity lost. But these two interpretations of COI are not interchangeable. Health economic analyses can be performed from the payer perspective (including direct costs only) and/or the societal perspective (including both direct and indirect costs). For the SCAQMD analysis, it is unclear which perspective is being presented for analysis.

Valuation functions for various health endpoints are provided in the Revised Draft AQMP documents, however it is not specified which are WTP valuations and which are COI. The documentation suggests that WTP is mainly utilized for mortality endpoints and COI for morbidity, but also acknowledges that for some morbidity endpoints WTP are used.[24] While WTP estimates are not available for every health effect of interest to this analysis, combining WTP and COI methodologies introduces significant uncertainties to the results.

Appendix 3-B includes a table (Table 3B-1) with a column for "Valuation Function" in which the monetary values range broadly (e.g., $0.35 per inhaler use, $9.2 million for respiratory

[22] 2022 Revised Draft AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp.pdf?sfvrsn=4.
[23] 2022 AQMP Draft Socioeconomic Report Appendices. Available at: https://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/2022-aqmp-socioeconomic-report/draft-socioeconomic-report-appendices.pdf?sfvrsn=2
[24] Ibid.

mortality, etc.). Additional details on how these numbers were incorporated into the total estimate provided are lacking and should be provided.

SCAQMD states[25]:

> *The morbidity-related health benefits were valued by a combination of COI and WTP. The directly avoided COI or the WTP for reduced risk of various morbidity symptoms were modeled as reduced consumer spending on healthcare-related goods and services and a corresponding reallocation of consumer spending from healthcare to other goods, services, and savings. The indirectly avoided COI, which was valued by the lost work time due to absences from work to recover or take care of ill dependents, were assumed to increase labor productivity for all industries.*

The health-based cost-effectiveness threshold analysis discusses how changes in the local economy resulting from avoided health costs may increase migration of new workers into the region, and provides calculations associated with economic migration.[26] The number of assumptions made in these analyses appears to be high; this in turn significantly affects uncertainty associated with the final model outcome. While it appears that outside bodies may have reviewed the methods and performed some sensitivity analyses to explore uncertainty associated with a small number of parameters, these results are also not provided in the SCAQMD's report.

Finally, if societal health costs are to be factored into cost effectiveness thresholds, they must include all the associated economic costs including but not limited to stranded assets, job losses, and possible higher consumer prices. As noted previously, these have not been factored.[27]

6. **The 2022 State Strategy for the State Implementation Plan acknowledged a NOx emission reduction shortfall for SCAB. That shortfall could be addressed in part through use of low-emitting internal combustion engine technologies and fuels.**

As stated in WSPA's comment letter dated July 5, 2022, CARB acknowledged in the Draft 2022 State Strategy for the State Implementation Plan an emission reduction shortfall necessary for attainment in the SCAB.[28] The State SIP strategy is therefore insufficient to attain the 70 ppb federal 8-hour ozone standard by 2037. Additionally, the State SIP Strategy and the 2022 AQMP do not address the federal Clean Air Act obligations to attain earlier ozone standards. WSPA noted that CARB is ignoring potential near term emission reductions by dismissing broader use of lower-emitting internal combustion technologies, resulting in delayed attainment in the SCAB.

In response to this comment, SCAQMD states[29]:

> *South Coast AQMD concurs that low NOx combustion technologies are critical to achieving NOx reductions in the near-term, which assists with attainment of ozone and PM2.5 standards with earlier attainment dates. Staff continues to advocate for the*

[25] Ibid.
[26] Ibid.
[27] SCAQMD Mobile Source Committee Meeting, September 16, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=zSMKn4miXuk.
[28] CARB Draft 2022 State Strategy for State Implementation Plan, January 31, 2022. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-01/Draft_2022_State_SIP_Strategy.pdf.
[29] SCAQMD Revised Draft AQMP Comments and Responses to Comments. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.

deployment of low NOx technologies in the absence of readily available zero emission technologies.

WSPA appreciates SCAQMD Staff's acknowledgement that attaining NOx reductions in the near term via low NOx technologies is critical to meeting attainment deadlines. WSPA encourages SCAQMD to consider rapid deployment of low NOx technology in the short term to achieve the necessary attainment goals not currently met through previous AQMPs.

7. **The District has proposed control measures addressing both VOC and NOx reductions. However, the District's attainment strategy has not demonstrated a need for VOC control measures.**

As discussed in WSPA's comment letter dated July 5, 2022, the District has proposed control measures addressing both VOC and NOx reductions, without showing that VOC reductions are necessary to meet ozone standards. The District's modeling provides isopleths which provide guidance for the formulation of future control strategies. The isopleths approximate the expected ozone design value for a given level of NOx and VOC emissions. As described by SCAQMD[30]:

> *With VOC emissions greater than 300 tons per day, the corresponding NOx emissions along the white contour are approximately 60-70 tons per day at GLEN and 70-80 tons per day at CRES. The isopleth further demonstrates that VOC reductions alone are insufficient to demonstrate attainment;* ***NOx reductions are the only pathway to attainment****. [emphasis added]*

SCAQMD responded to this comment, stating that VOC reductions are necessary due to the "NOx disbenefit," which is an atmospheric phenomenon whereby decreases in NOx can lead to increases in ozone.[31] However, SCAQMD did not provide any documentation showing that the NOx disbenefit is not already accounted for in the modeling analysis. We respectfully request that SCAQMD provide that technical basis.

8. **In order to demonstrate attainment by the 2037 deadline, the next generation ultra-low NOx burners proposed by control measure L-CMB-07 must be developed and commercially available on a timeline that allows for rulemaking and facility engineering to be complete.**

Proposed Control Measure L-CMB-07 addresses NOx emissions at petroleum refineries, and specifically calls out refinery boilers and process heaters. The District suggests a transition of such equipment to ZE, near ZE, or "other technologies."

SCAQMD Rule 1109.1, Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations, was developed as a result of the 2016 AQMP control measure CMB-05, which required a transition from RECLAIM to a command and control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) level controls as soon as practicable.[32,33] As discussed in WSPA's comment letter dated July 5, 2022, the final permit actions required under R1109.1 are not due until January 1, 2031, with compliance required no later than 36 months after Permit to Construct (PTC) issuance.

[30] SCAQMD Draft 2022 AQMP, Appendix V. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/combined-appendix-v.pdf?sfvrsn=8.
[31] SCAQMD Revised Draft AQMP Comments and Responses to Comments. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[32] SCAQMD Rule 1109.1. Available at: https://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1109-1.pdf?sfvrsn=8.
[33] SCAQMD 2016 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

Depending on permit application processing time, final compliance with Rule 1109.1 requirements for some equipment could be as late as 2034-2036.

In their response to this comment, SCAQMD acknowledged that there are a small number of units that will be subject to the above stated schedule but noted that the majority of the NOx control projects would be implemented by 2031.[34] While that may be true, adding a new refinery equipment rule while the current one (i.e., R1109.1) is still being implemented could cause capital project planning problems and potentially stranded assets.

Implementation of control measures under this AQMP would need to be in place by 2035 to be useful for the 2037 attainment demonstration. Refinery capital projects are complex affairs, requiring significant planning, engineering, and then sequencing construction with unit turnaround schedules. These projects would need to begin by 2028 in order to support this AQMP's attainment demonstration. SCAQMD has proposed to initiate rule development for L-CMB-07 between 2025 and 2027 to achieve emission reductions by 2037.[35] The SCAQMD response to WSPA comments in the July 5, 2022 letter acknowledges that the rule development process for Rule 1109.1 took approximately 3.5 years and a similar timeframe will be needed for rule development related to L-CMB-07.[36] Using that math, L-CMB-07 rulemaking would start in approximately 2025.

Additional controls and proposed reductions in L-CMB-07 are focused primarily on boilers and process heaters with a maximum rated heat input of 40 MMBtu/hr or larger. SCAQMD is proposing that all of the emission reductions for the control measure can be achieved using next generation ultra-low NOx burner technology (ULNB).[37] These technologies are still under development and are not commercially available. In order to be incorporated into the rulemaking timeline listed above, these ULNB technologies would now need to be fully developed and proven by ~2025.

At Proposed Rule 1109.1 (PR1109.1) Working Group Meeting (WGM) #17, one vendor provided a presentation on development of their core process burner. The presentation cited < 7 ppm NOx emissions for a limited number of projects involving equipment rated at 39 MMBtu/hr or less.[38] However, it was unclear if any of the projects were able to demonstrate the lower emission rate when burning refinery fuel gas, or whether any of the projects involved equipment rated at ≥40 MMBtu/hr input, as suggested in the proposed L-CMB-07 measure. SCAQMD provided information on a different burner technology at PR1109.1 WGM #12, noting that the burner system requires heat releases between 1 and 20 MMBtu/hr, and has been demonstrated to achieve approximately 5 ppm NOx using natural gas at a test facility. That vendor noted that refinery fuel gas may result in higher emissions.[39] Due to the expectation of higher emissions when burning refinery fuel gas, SCAQMD evaluated the cost-effectiveness of a 9 ppm BARCT endpoint for NOx for

[34] SCAQMD Revised Draft 2022 AQMP, Comments and Responses to Comments. Response to Comment 72-2. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[35] SCAQMD Revised Draft AQMP, Appendix IV. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-appendix-iv-a.pdf?sfvrsn=6.
[36] SCAQMD Revised Draft 2022 AQMP, Comments and Responses to Comments. Response to Comment 72-2. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-comments-and-responses-to-comments.pdf?sfvrsn=6.
[37] SCAQMD Revised Draft AQMP, Appendix IV. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/revised-draft-2022-aqmp/revised-draft-2022-aqmp-appendix-iv-a.pdf?sfvrsn=6.
[38] SCAQMD Proposed Rule 1109.1 WGM #17. ClearSign Technologies Presentation. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/clearsign-update-for-scaqmd---pr-1109-1.pdf?sfvrsn=6.
[39] SCAQMD PR1109.1 WGM #9 Presentation. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/pr1109-1-wgm_9_final.pdf?sfvrsn=12.

equipment burning refinery fuel gas. These technologies must be developed by 2025, with demonstration showing that the technology can result in desired NOx emission rates when burning refinery fuel gas.

In addition to commercial demonstrations, the equipment for the emerging technologies must be able to fit into the existing boiler or process heater footprint so as not to require complete replacement of the equipment. As noted by the November 2020 Fossil Energy Research Corporation (FERCo) report, the physical spaces around refinery heater units are typically very congested.[40] Cost considerations associated with dimensional constraints must be considered during the rulemaking process and associated cost-effectiveness analysis. These is no reason to expect that these factors/constraints have changed since R1109.1 was adopted.

9. **The District needs to provide an explanation for the change in the proposed emission reductions for L-CMB-07.**

   The Revised Draft 2022 AQMP included a new value for L-CMB-07 emissions reductions at 0.88 tons per day, increased from 0.77 tons per day provided in the Draft 2022 AQMP, a 14% increase. Given that the proposed control technologies under this measure have not changed, SCAQMD should provide further information on this change and its technical feasibility.

WSPA appreciates the opportunity to provide these comments related to the 2022 AQMP. We look forward to continued discussion of this important Plan development. If you have any questions, please contact me at (310) 808-2146 or via e-mail at rcromartie@wspa.org.

Sincerely,

Marina Comate

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[40] FERCo South Coast Air Quality Management District Rule 1109.1 Study Final Report (FERCo Report), page 5-3, November 2020. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/ferco-report.pdf?sfvrsn=6.