

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

Advisory Council Meeting
Monday, January 30, 2023

APPROVED MINUTES

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

This meeting was conducted under procedures authorized by Assembly Bill 361 (Rivas 2021), allowing remote meetings. Members of the Advisory Council participated by teleconference.

CALL TO ORDER

1. **Opening Comments:** Advisory Council (Council) Co-Chairperson, Dr. Gina Solomon, called the meeting to order at 8:33 a.m.

Roll Call:

Present: Co-Chairpersons Dr. Linda Rudolph and Dr. Gina Solomon; Vice Chairperson Professor Michael Kleinman; and Members Dr. Danny Cullenward, Dr. Adrienne Hollis, Garima Raheja, and Board Liaison David Haubert.

Absent: Dr. Pallavi Phartiyal.

2. **PUBLIC MEETING PROCEDURE**

At this point in the meeting, the Council wished to take a formal vote to transfer this meeting's facilitation from that of Co-Chair Rudolph to Vice Chair Kleinman, at Dr. Solomon's request.

Council Action

Board Liaison Haubert made a motion, seconded by Dr. Cullenward, to **designate** Vice Chair Kleinman as the facilitator for the Advisory Council meeting of January 30, 2023; and the motion **carried** by the following vote of the Council:

AYES: Cullenward, Haubert, Hollis, Kleinman, Raheja, Rudolph, Solomon.
NOES: None.
ABSTAIN: None.
ABSENT: Phartiyal.

3. **APPROVAL OF THE ADVISORY COUNCIL MEETING MINUTES OF SEPTEMBER 12, 2022**

Public Comments

No requests received.

Council Comments

None.

Council Action

Board Liaison Haubert made a motion, seconded by Dr. Cullenward, to **approve** the Minutes of the Advisory Council meeting of September 12, 2022; and the motion **carried** by the following vote of the Council:

AYES: Cullenward, Haubert, Hollis, Kleinman, Raheja, Rudolph, Solomon.
NOES: None.
ABSTAIN: None.
ABSENT: Phartiyal.

4. **UPDATE ON THE PROPOSED METHODOLOGY FOR DETERMINING LOCAL HEALTH RISKS FROM FINE PARTICULATE MATTER (PM_{2.5})**

Greg Nudd, Deputy Air Pollution Control Officer of Policy, introduced Dr. David Holstius, Senior Advanced Projects Advisor, who gave the staff presentation *Local Risk Methodology Update*, including: overview; recap of progress during 2022; infiltration; recommendation; revised net adjustments; methodological considerations; public comments – overview and methodology; and effect size.

Public Comments

No requests received.

Council Comments

The Council and staff discussed the potential application of PM_{2.5} infiltration factors to the proposed methodology. Councilmember Raheja inquired whether a recent study of infiltration factors during a wildfire would be helpful, and/or a plot of concentration versus infiltration factor; staff explained that the factors need to correspond to the conditions in the studies from which effect size estimates were derived. Co-Chair Solomon inquired whether staff had identified studies that more closely parallel the Bay Area’s housing conditions. Staff clarified that they had, and that the numerator would be the term to reflect those, while the denominator should correspond to the conditions of the epidemiological studies; since the numerator is intended to reflect a 95th percentile or similar, its value should be at least 0.9, but that 1 is recommended, in order to align with the cancer-risk framework, where the receptor is effectively unsheltered; this also addresses a previous Council comment about whether unsheltered groups were being accounted for. Co-Chair Solomon agreed that this was a sensible approach.

Councilmember Cullenward thanked staff for the provision of confidence intervals for published relative risks, and for the explanation of how they were standardized to unit concentrations. The Council expressed support for an administratively streamlined approach to selecting effect-size estimates, that settling on a representative choice while retaining supporting evidence is reasonable, and that continuing to follow the progress of the US EPA in determining effect sizes is warranted.

Director Haubert brought up that the Bay Area has unique approaches to particulate matter (PM) regulation that do not exist elsewhere, and asked whether a Bay Area specific study would be possible or had been considered. Staff responded that the specific conditions of the Bay Area will be carefully considered when policy applications are considered, that a conversation with Board members on that topic is needed, and that the intent of this methodology is to provide a number, likely based on national studies with the required amount of data to form reliable estimates of risk. Co-Chair Solomon added that PM is unusual in how well it has been studied in many areas, and that trying to replicate that level of effort in the Bay Area could take several decades. Co-Chair Solomon then remarked that the approach taken to arrive at an effect-size should be described as a “convergence,” rather than an “approximation,” since there are multiple studies, including meta-analyses, that are converging on the same number; that this is showing consistency of the epidemiologic evidence, and the approach taken by staff is correct, looking at multiple lines of evidence, without attempting a new meta-analysis. Acting Co-Chair Kleinman concluded by commending the report, noting that it has helped to clarify much of the way to think about this topic, and that further work is needed to understand the implications, but that the methodology appears consistent with the thinking of the US EPA in their ongoing reconsideration of national standards.

Council Action

None; receive and file.

5. COMMENTS ON THE PROPOSED METHODOLOGY FOR DETERMINING LOCAL HEALTH RISKS FROM FINE PARTICULATE MATTER (PM)_{2.5}

The Council received presentations from three organizations that provided public comment on the Air District’s draft white paper, *Modeling Local Sources of Fine Particulate Matter (PM)_{2.5} for Risk Management*.

Firstly, Christine Wolfe of the California Council for Environmental and Economic Balance (CCEEB), gave the presentation *Risk Management and Regulatory Context*. Ms. Wolfe gave recommendations for guiding principles, including: best available science; input and lessons learned from other agencies; speciation and source apportionment; regional vs local impacts and control strategies; economic evaluation; prioritization via near-term cost-effectiveness; avoiding duplication or conflict with other regulations; achievable and easily understood pathways to compliance; and proportionality. Ms. Wolfe noted that, while several comments would be policy-focused—for example, that the approach may be in conflict with the Health and Safety Code, which identifies the Office of Environmental Health Hazard Assessment (OEHHA) as the entity that identifies and establishes health values for Toxic Air Contaminants in consultation with the California Air Resources Board (CARB)—it was important to address the method itself in the context of its application. Ms. Wolfe expressed concern that simplifying assumptions in the method would result neither in expeditious implementation nor ease of understanding, and that best available data should be used, even where it adds complexity, but that this would also depend on the application context, to balance accuracy versus consistency, if it is intended

to support multiple regulatory programs. Regarding the proposed adjustment factors for sensitivity, Ms. Wolfe stated that the proposed methodology is extraordinarily conservative, and asked in which contexts a maximum risk framework would be most appropriate. As an example, Ms. Wolfe asked whether it would be appropriate for every California Environmental Quality Act (CEQA) project review to trigger the highest level of review; or whether the methodology's application would change the number or type of permit applications that go through a Health Risk Assessment (HRA). Ms. Wolfe expressed interest in hearing the Advisory Council discuss how the Air District should communicate and contextualize the screening-level risk scores, noting that the numbers are much higher than those typically discussed in the context of cancer risk. The following recommendations were presented: that the potential applications be prioritized, and the methodology be revised in line with those; that existing regional, statewide, and federal regulations be summarized, to assess potential alignments and/or conflicts with applications of the proposed methodology; that an independent third party publicly conduct a validation of all equations and calculations, via a test case; that staff clarify how the methodology would be updated in the future, including updates for efficacy and accuracy as the Air District's PM_{2.5} inventory changes over time; and that a full regulatory analysis be conducted prior to any application.

Secondly, Ken Szutu, a member of the Air District's Community Advisory Council, gave a presentation on recent activities of the Citizen Air Monitoring Network in Vallejo, of which he is also a member. Mr. Szutu welcomed the attention to local sources and risks, and stated: that modeling needs to reflect the experience of the community; that PM_{2.5} emissions from incidents, and from startup and shutdown, should be included; and that PM_{2.5} speciation is necessary for risk considerations. An aerial photo was shown of a plume from a fire at the NuStar facility on October 15, 2019, as an illustration of an incident affecting the community; a map of the affected area's priority population designations (from California Climate Investments) was also shown; then a chart showing elevated asthma rates in Vallejo. Mr. Szutu concluded by enjoining staff to ensure that the model reflects reality, and covers the experience of the community, specifically including PM_{2.5} releases from industrial incidents, as well as startup and shutdown emissions, and speciation of PM_{2.5}.

Finally, Kevin Buchan from the Western States Petroleum Association (WSPA) introduced Dr. Julie Goodman of Gradient, who gave the presentation *Modeling Local Sources of Fine Particulate Matter (PM_{2.5}) for Risk Management*. Dr. Goodman argued that the model highly overestimates risks associated with PM_{2.5} increments of 0.001–0.3 ug/m³, and that the observed associations of PM_{2.5} with mortality in the scientific literature do not necessarily reveal a causal relationship, but are explainable instead by: exposure measurement error (ambient vs personal, indoor vs outdoor); bias (due to the conflation of historically higher levels with estimates used in studies); confounding (by unmeasured confounders, or by imprecise measures); chance; or the wrong model (threshold vs no-threshold, arguing that model and measurement error linearize the exposure-response curve). Dr. Goodman also proposed that there is a level of PM_{2.5} below which the human body will not be adversely affected, and that a threshold-based approach is taken with all currently assessed non-cancer endpoints. Dr. Goodman further stated that the risk estimates are too small to be significant, due to the possibility of bias or confounding, and are so small as to be negligible in comparison with hourly and daily variability in the levels of PM_{2.5} in the Bay Area. With regard to premature mortality, Dr. Goodman stated that the range of mortality risk estimates supported by the literature is much wider than that modeled using the US EPA's BenMAP platform, and that with regard to childhood asthma onset, this has not been fully examined, but is in her opinion not likely accurate or reliable, noting that the risk estimate is based on a single study. Dr. Goodman then presented charts of daily variability in PM_{2.5} levels across the Bay Area, stating that the ranges of daily or hourly data are much larger than the (annual average) increments

considered by the methodology, such that the latter appear negligible. Dr. Goodman concluded by recommending that the model consider using a threshold and look at much larger increments of PM_{2.5}.

Public Comments

Public comments were given by Dr. Stephen Rosenblum, Palo Alto, who noted concern with the presentation by Dr. Goodman, specifically in terms of its being sponsored by an industry stakeholder group, and parallels with arguments made decades ago in the context of regulating risks from nuclear radiation, while the precautionary principle justifies action now, rather than waiting for decades for harms to manifest, particularly given the Advisory Council's position on the risks from levels of PM_{2.5} below the current NAAQS; by Janelle Payne, who noted a recent New York Times article reporting that Dr. Goodman provided testimony on behalf of industry stakeholders in a case in Oregon involving exposures to pollution from gas stoves, without acknowledging their sponsorship; and by Bob Brown (on behalf of WSPA), who stated that it was clear that Dr. Goodman's services had been retained by WSPA in the present context.

Council Comments

Co-Chair Solomon expressed that many of the topics related to Dr. Goodman's points had been grappled with very seriously during the Advisory Council's writing of its report on particulate matter. Regarding exposure measurement error in particular, no evidence of differential misclassification was noted, and non-differential misclassification tends to lead to under-estimates of true effects; the effect of the difference between indoor and outdoor levels is an example of the latter, but Dr. Goodman seemed to imply the opposite, which was not understood. Dr. Goodman encouraged the Council to consider the biological plausibility of a no-threshold model; Co-Chair Solomon responded that while this is among the scenarios generally discussed in the National Academy of Science, Engineering, and Medicine's *Science and Decisions* (2009) report, the relevant scenario in the present case is one where one can observe a linear dose-response when people are already above a threshold, so that there may be in theory some biological threshold, but there are already people who are sensitive and also exposed. Co-Chair Solomon added that she had not seen any evidence for a threshold in the literature.

Councilmember Cullenward addressed Dr. Goodman, citing a number of studies and conference presentations authored by Dr. Goodman, and confirming that they had been funded by industry stakeholder groups including the Western States Petroleum Association, the Electric Power Research Institute, the American Petroleum Institute, the American Gas Association, the American Plastics Council, and Philip Morris. Dr. Goodman replied that she has worked extensively on behalf of a number of clients and strives to disclose her funding sources, but that the most important thing is that her methods are as transparent as possible, and encouraged attention to her methods. Dr. Cullenward inquired whether Dr. Goodman would represent her methods as being internally consistent and in line with applicable scientific consensus. Dr. Goodman replied that there is not always consensus, and science progresses by everyone doing their best to be objective. Dr. Cullenward offered to present a court decision in which a Massachusetts judge determined the testimony from another consultant at Gradient, in support of which Dr. Goodman had provided statistical analysis, to be "inconsistent with and contrary to the consensus of the scientific community."

Co-Chair Solomon then discussed the possibility of temporal misclassification that Dr. Goodman had raised, noting that studies with a wide range of time windows, including very rapid changes in PM_{2.5}, had found evidence of effects, and that the intent was to act promptly to prevent further harms. Dr.

Goodman agreed that there was no benefit to increasing pollution, but stated that decrements of 0.001–0.3 ug/m³ were “in the noise,” to which Co-Chair Solomon replied that bringing down the mean decreases the entire distribution, including the “noise,” which is important, and this activity is aimed at that. Acting Co-Chair Kleinman stated that looking at hourly and daily variation exaggerates the degree of variation, when we are concerned with longer-term changes, and annual averages have much smaller variation; even so, some of the earliest Harvard studies that looked at very different cities found that, on the whole, rates of disease and death were associated with contrasts in average pollution; moreover, that long-term follow-up showed that as pollution levels dropped, the mortality and respiratory disease rates dropped; further, that happened in the cities that had very low levels, as well as the cities that had high levels; while there may be a threshold at a very low level, we have not come anywhere near that level, in part because there is such a wide range of susceptibility in the human population, and our mission is to protect people at the most sensitive levels; a margin of safety is needed to cover them; therefore, there is good reason to use a conservative approach in assessing risks.

Director Haubert expressed hope, as a non-scientist, that the Advisory Council will be able to offer to the Board of Directors its assessment of the science, and a preference that the discussion, while allowing for different viewpoints, stay focused on the science. Director Haubert expressed that the Board will have to take into account policy matters including the economic impacts of regulations, and alternatives.

Co-Chair Solomon responded to Dr. Goodman’s earlier mention of the meta-review by Burns et al (2017), noting that while it reviewed the effectiveness of interventions around the world to reduce PM_{2.5}, it reported that in most cases the data was insufficient to draw conclusions, but when the data was adequate, it did find effects, and in no cases did it find any evidence to the contrary, which was reassuring. Co-Chair Solomon asked whether the Council or staff had any thoughts on the topic of demonstrating efficacy.

With apologies to Director Haubert, Councilmember Cullenward expressed a desire to make a comment about the overall situation, coming from a long career in climate science and policy. Councilmember Cullenward shared that in the early 2000s, when colleagues began linking “climate denial” patterns to tobacco litigation, he found them incredible, alarmist, and muddying of the already-difficult policy waters; that context was similar to the one faced here in a local environmental regulation context; since then, faced with growing evidence, he has changed his mind; he opined that the Council had just heard a textbook example of strategies used to delay, create uncertainty and doubt and fear in tobacco litigation, being applied to environmental science; and that the connections between individuals and firms need to be made and talked about publicly, along with the track record, so that discussion can proceed more appropriately.

Co-Chair Solomon recalled that the first commenter (Ms. Wolfe, on behalf of CCEEB) requested a case study, and found that proposal interesting and reasonable. Co-Chair Solomon requested clarification on future direction, including the potential for regular updates mentioned by Ms. Wolfe: would it take the form of rulemaking, or guidance? Staff agreed that a case study would be a good idea, especially in the context of risk communication, to help ground the discussion in the context of, for example, setting significance thresholds for CEQA guidance; similarly, in permitting, there would be a full regulatory context, while staff recommend that this methodology itself be kept outside that context. Co-Chair Solomon concurred with the idea, and with the value of being able to incorporate newer science and make adjustments in practice.

Co-Chair Solomon recalled that the second commenter (Mr. Szutu, of the Air District’s Community Advisory Council and the Citizen Air Monitoring Network in Vallejo) had urged consideration of PM speciation; agreeing that speciation is important to inform control strategies and efforts, Dr. Solomon noted that it becomes tricky in a risk-assessment context, where there are important data gaps, and advised that wrapping it into this process might grind things to a halt. On the issue of upset and startup/shutdown conditions, Co-Chair Solomon expressed that this is an important area of focus, and that we want to avoid such events impacting communities, without knowing whether that is best accommodated through this methodology. Acting Co-Chair Kleinman agreed that when starting with a focus on risk, it is much more difficult to take speciation into account.

Dr. Kleinman recalled a comment by Ms. Wolfe about “unrealistic assumptions,” and invited staff to comment on the use of some of the more conservative aspects of the methodology, like higher-than-average breathing rates. Staff clarified that there are two aspects in which the proposed methodology departs from written OEHHA guidance (for the Hot Spots program): first, it assumes that seniors are at home 100% of the time, instead of 73%; second, it prescribes a factor of 3 to offer protection for variation along the dimensions of socio-economic status and race/ethnicity. Apart from this, staff clarified, every parameter and every value for a parameter is adapted directly from written OEHHA guidance (for the Hot Spots program).

Co-Chair Solomon, returning to the issue of biological mechanisms, described the wide range of defense mechanisms that people have against PM; therefore, while one can make a theoretical argument that a threshold does exist, in the real world, it is very challenging to imagine what that is, or what it would look like; when people have such a wide range of background exposures and sensitivities, the argument falls apart, and we are left with essentially the same problem we have with carcinogens, and the assumption that there is no safe number; this is absolutely consistent with the science and with our approach to other pollutants where we cannot discern a safe level; it is important to clarify that we are saying that there are already people tipped over into disease, and we cannot identify a safe additional exposure for those people. Acting Co-Chair Kleinman added that perhaps individuals may have their own thresholds, but that has largely to do with how we are able to make measurements, and we should remain cognizant that what results in a small effect for one person may result in larger effects for someone else with, for example, a smaller airway, or other respiratory impairments; the policies that are developed should protect this diverse group of people; therefore, a threshold is not the real point of providing public protection; rather, we see important changes in some populations even when we look at levels below the current standard.

Council Action

None; receive and file.

6. REVISION OF THE PM_{2.5} NATIONAL AMBIENT AIR QUALITY STANDARD: THE ROLE OF AIR MONITORING DATA

Mr. Nudd introduced Dr. Kate Hoag, Meteorology and Measurement Assistant Manager, who gave the staff presentation *Revision of the PM_{2.5} National Ambient Air Quality Standard: The Role of Air Monitoring Data*, including: outcome; outline; information only; National Ambient Air Quality Standards (NAAQS); PM NAAQS (primary); Revised Annual PM_{2.5} NAAQS Proposal; Commenting on the PM NAAQS Proposal; What Happens After EPA Revises a NAAQS; Goals for Air Monitoring; How Should We Compare a Highly Variable Dataset (Air Monitoring Data) To One Number

(NAAQS); Design Value (DV): A Statistic to Summarize Air Monitoring Data to Compare to NAAQS; Example: DV for a Monitoring Site; Annual PM_{2.5} Design Value Trends; PM_{2.5} Trends: Wildfire Impacts; NAAQS Designations & Implementation; Finalizing the NAAQS; Initial Area Designations; Developing a State Implementation Plan (SIP); and next steps.

Public Comments

Public comments were given by Dr. Stephen Rosenblum, Palo Alto resident.

Council Comments

The Council and staff discussed whether the frequency of wildfires, which are currently considered “exceptional events” needs to be considered when revising the NAAQS; and whether currently identified Air District priorities would need to shift to accommodate the required development of the State Implementation Plan, due 2026.

Council Action

None; receive and file.

OTHER BUSINESS

7. REPORT OF THE INTERIM EXECUTIVE OFFICER/AIR POLLUTION CONTROL OFFICER (APCO)

Sharon L. Landers, Interim Executive Officer/APCO, reported the following:

- Air District staff has released proposed amendments to Rules 9-4 and 9-6 to reduce emissions of nitrogen oxides from residential and commercial furnaces and water heaters in buildings in the Bay Area. These rules govern point of sale emission standards for small, typically residential and commercial, water and space heating systems. Emissions of nitrogen oxides impact local and regional air quality and contribute to the formation of ozone and secondary particulate matter. The Air District Board of Directors will conduct a public hearing to consider adoption of the proposed amendments and certification of the Environmental Impact Report (EIR) on March 15, 2023, at 9:00 AM. Staff plans to convene a formalized ongoing Implementation Working Group (IWG) to support the proposed rule amendments after potential adoption. The IWG is intended to consist of a variety of stakeholders with different areas of expertise in reference to the implementation of the rule amendments. This may include community-based organizations, environmental justice groups, advocacy, and subject matter expert organizations, building technology experts, affordable and market rate housing developers and managers, local and state government staff, funding and financing agencies, equipment manufacturers and distributors, tenant representation organizations and labor organizations.
- On February 28, 2022, the Governor’s State of Emergency will expire, requiring a return to in-person meetings of local legislative bodies, under the Ralph M. Brown Act and Assembly Bill (AB) 2449 (Rubio). The Air District is developing new procedures for in-person meetings that will enable limited remote attendance in publicly accessible remote locations.
- The Governor’s 2023-24 Budget was released on January 10, 2023. A budget deficit of \$22.5 billion is anticipated. Program cuts are anticipated to affect programs of interest to the Air

District. Budget hearings will be held, leading up to the 2022-23 May Revision to the Governor's Budget.

- The 2023 Legislative Session has begun, and members will soon be introducing bills; 2,500 are anticipated in February. Air District Legislative staff tracks air quality-related bills and participates in committee hearings and advocacy activities, per the Board's Legislative Committee.
- On December 21, 2022, the Board of Directors confirmed the appointment of Dr. Philip M. Fine as the Air District's new Executive Officer/APCO, effective February 21, 2023.
- Recruitment for all seven Advisory Council positions is open until February 24, 2023, as the current Councilmembers' terms end in October 2023. Current Councilmembers are encouraged to reapply.

Council Comments

Members of the Council thanked Ms. Landers for her service as Interim Executive Officer/APCO.

8. PUBLIC COMMENT ON NON-AGENDA MATTERS

No requests received.

9. BOARD MEMBER COMMENTS

None.

10. TIME AND PLACE OF NEXT MEETING

At the end of the meeting, the next Advisory Council meeting was to be held at the Call of the Chair. After the meeting adjourned, the next meeting was scheduled for Monday, June 12, 2023, at 8:30 a.m., at 375 Beale Street, San Francisco, California, 94105. The meeting will be in-person for members of the public will be able to either join in person or via webcast.

11. ADJOURNMENT

The meeting adjourned at 11:48 a.m.

/s/ Marcy Hiratzka & David Holstius
Marcy Hiratzka & Dr. David Holstius