

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
(415) 749-5000

APPROVED MINUTES

Advisory Council Regular Meeting
Wednesday, November 9, 2011
9:00 a.m.

CALL TO ORDER

Opening Comment: Vice Chair Stan Hayes called the meeting to order at 9:02 a.m.

ROLL CALL

Present: Vice Chairperson Stan Hayes, Secretary Robert Bornstein and Council Members Sam Altshuler, P.E., Louise Bedsworth, Ph.D., Benjamin Bolles, Jeffrey Bramlett, Harold Brazil, Jonathan Cherry, Alexandra Desautels, John Holtzclaw, Ph.D., Gary Lucks JD, CPEA, REA, Liz Lutzker, Jane Martin, Ph.D., Kendall Oku, and Jonathan Ruel, and Dorothy Vura-Weis, M.D., M.P.H.

Arrived Late: Chairperson Ken Blonski, M.S.; and Council Members Jenny Bard, Harold Brazil, Kraig Kurucz, and Kendall Oku

Absent: None

Public Comment Period: There were no public comments.

CONSENT CALENDAR

1. Approval of Minutes of the October 12, 2011 Advisory Council Meeting:

Mr. Altshuler suggested continuing the minutes. He cited various errors and asked to attach presentations of speakers. Mr. Hayes thanked the Clerk for her efforts in drafting the lengthy set of minutes, indicated that the presentation was complex given the discussion on ultrafine particles.

Ms. Roggenkamp explained that the minutes are something staff has been grappling with given the detail of the presentations and necessary staff time to complete them.

The following revisions were requested by Council Members:

- Page 3, second paragraph amended to read, “It was understood that this was not the case.”
- Page 2, second paragraph; “...and knowledge ~~aps~~ gaps and its historical perspective.”
- Page 4, first full paragraph; 4th line, delete “gasoline direct injection” (repeated twice). Change the next sentence to say, “This means that diesel is very efficient so a gasoline engine would run like a diesel engine.”
- Page 5, the first full paragraph to read, “Diesel PM is comprised of sixty percent ~~of diesel PM is~~ carbon,” The fifth line of that paragraph should read, “Moving from diesel oxidation catalyst to the particulate filter results in virtual elimination of soot.”
- Page 3, first paragraph, second sentence amended to read; “...needed and was able to utilize ~~in~~ its own diesel assessment program.”
- Page 13, second paragraph, last line amended to read “...getting rid of the emissions to the ~~extent~~ extent that we can.”
- Page 5, replace “Diesel PM consists of:” with “The formation of diesel PM is affected by:”
- Page 17, first full paragraph, third line amended to read, “...if this would be considered more of a ~~nuisance~~-nuance policy approach...”

Council Action: Mr. Bramlett made a motion to approve the minutes of October 12, 2011, as amended. Mr. Hayes seconded the motion; carried unanimously without objection.

Mr. Hayes stated that Mr. Altshuler has agreed to lead the discussion of the draft report. He thanked the subcommittee for drafting the report and those offering comments. The handout distributed this date represents comments from the subcommittee, and changes were also made after the final submission of the agenda packet.

DISCUSSION

2. Discussion of draft report on the Advisory Council’s October 12, 2011 meeting – (*agreed upon amendments to Draft Report are reflected in bold*)

Member Bramlett referred to the first bullet on page 3; “We need to be careful about generalizing the use and definition of UFP (particles with diameter < 100 mm)”. In all other uses, the statement is fine, but in this particular usage, he felt they want the definition of that term. Mr. Hayes said it was duplicative of the first line in the next bullet.

Dr. Bornstein stated the two sentences were two points; the first line was the definition and the second one might be changed to say it is not created equal in terms of their health impacts. He suggested inserting a comma after “equal” to read “Not all UFP particles are created equal, as their number, size, chemical...” The reason why they are not equal is explained in the next sentence.

Mr. Ruel and Dr. Vura Weis suggested amendment to the second bullet: **“Not all UFPs ~~particles~~ are created equal in terms of either composition or health impacts.,” ~~”especially in terms of health impacts.”~~”**

Ms. Bard asked to replace (particles with diameter < 100 nm with “(particles with diameter of 0.1 or equivalent to 0.1 microns)”). Dr. Bornstein asked to insert “see glossary for all acronyms;” inside the parenthesis at the first bullet point before the word ‘particles’. **The first bullet would therefore read: We need to be careful about generalizing UFP (see glossary for all acronyms; particles with diameter of 0.1 or equivalent to 0.1 microns)”**.

And, Council Members asked to replace any instances of “UPF” with “UFP” as needed.

Mr. Altshuler referred to Dr. Ayala’s discussion of cold start emissions and said he wasn’t quite sure yet where these comments should be placed. Mr. Hayes noted Dr. Ayala’s comments are in red which are minor modifications to the Advisory Council’s comments, and he supported them.

Dr. Bornstein referred to page 3, second bullet from the bottom; “UFP monitors” and questioned whether his was a correct statement as some members did not remember it in this regard. Council Members concurred this was correct.

Mr. Altshuler suggested inserting a new bullet after the 4th bullet (under ‘85% of urban California...’) as follows:

- “The biggest challenge with engines is cold start emissions, as this exceeds by far the total emissions that are generated while driving.”

Ms. Lutzker questioned if after driving 500 miles, did the cold start emissions greatly exceed the total emissions for the remainder of the trip. Mr. Hayes suggested amendment to read, “...as this typically exceeds the total...” Mr. Altshuler and Mr. Hayes requested the sentence be amended to read “...as these can exceed those emissions generated while driving.”

- **“The biggest challenge with engines is cold start emissions, as these can exceed those emissions generated while driving.”**

Mr. Kurucz referred to the last bullet on page 3, and said the last sentence was confusing to him, as it indicates sometimes emissions can be high from anything and does not wrap up the paragraph. Mr. Kendall said his recollection is his discussion about transient conditions; that there are test cycles and technologies that can have low emissions, but during transient mode, the cold start, or hard acceleration, any technology can have significant UFP emissions.

Mr. Kurucz said even though a good technology is chosen, there are technologies with high emissions. Dr. Bornstein suggested beginning the sentence by saying “High UFP particle numbers come from certain technologies. These are the three, but under some conditions UFP can be emitted from any engine type.” Mr. Altshuler and Mr. Kurucz did not feel this is what Dr. Ayala was saying because he was also saying if it is tuned right, you can get low UFP particle numbers.

Mr. Kurucz and Dr. Bornstein agreed to add “under the right circumstances” after “are possible”. And, “under some conditions, UFP can be emitted in the exhaust from all engines, even low emitting engines under some conditions that have high emissions.” Mr. Hayes suggested moving the sentence to the first part of the bullet.

Dr. Vura Weis said it seems that part of the point of this was that using good technology, even though these types of engines can have low UFP emissions, you cannot eliminate them entirely.

Mr. Hayes and Council Members agreed to split the last bullet point into two bullet points, as follows:

- **One frequently measured indicator of UFP is particle number, that is, the number of particles in a cubic centimeter of air.**
- **Under some driving conditions, UFP will still be emitted in the exhaust from all engines. Low UFP particle number emissions are possible using advance technologies with all fuel or engine types (CNG-fueled, conventional gasoline, and diesel engines).**

Mr. Kurucz referred to the next to the last bullet point on page 4 before Dr. Michael Kleinman’s points, “Gasoline engine technology is also evolving.” He asked if they should really be talking about carbon dioxide and not carbon monoxide emissions. Mr. Altshuler said yes, and Mr. Hayes noted there is a trade-off between the two.

Mr. Kurucz suggested adding the word “GDI” between earlier-vintage and engines; to read, “...**climate protection purposes, but in earlier-vintage GDI engines emitted higher total PM mass and UFP particle counts than conventional gasoline engines.**”

Ms. Bard referred back to the last bullet on page 3, asked for clarification on whether it is low or high, and to clarify whether low or high UFP particle number missions are possible with even new technologies. She asked that the word “various” be changed to “even new technologies”. Dr. Bornstein said not if it includes “low;” as low as possible from even the old ones and even the new ones have a little bit, but he agreed it has not been captured in the wording.

Dr. Vura Weis said when saying “various technologies” she sees these as fuel sources. Ms. Bard said she thinks it is confusing. Under some driving conditions, UFP can be emitted in the exhaust PM from all engines” covers it, and she asked to delete the second sentence. Dr. Bornstein asked

to add after “exhaust from...any engine type and fuel combination.” Mr. Hayes supported deletion of the second sentence and the proposed amendments, so the bullet points would read, as follows:

- **One frequently measured indicator of UFP is particle number, that is, the number of particles in a cubic centimeter of air.**
- **Under some driving conditions, UFP will still be emitted in the exhaust from any engine type and fuel combination. ~~all engines. Low UFP particle number emissions are possible using advance technologies with all fuel or engine types (CNG-fueled, conventional gasoline, and diesel engines).~~**

Mr. Hayes questioned if Council Members had comments on Dr. Michael Kleinman’s comments.

Ms. Lutzker referred to page 5 and the series of experiments that were done. She said none of the experiments listed actually speak to the inflammation in the brain nor the point that states, “these results suggest that”. They are all focused on allergies and cardiovascular disease and she suggested removing “induced inflammation in the brain” from this description or, add in the experiments that did describe inflammation in the brain and include a result in the next bullet that states “These results suggest that”.

Mr. Hayes stated Dr. Kleinman discussed the four experiments he did and also had a lot to talk about brain inflammation which he did not believe were based on experiments he had done but from others’ work. He thought it was something important to say, but it was not based on his own research.

Ms. Lutzker noted the reference was contained in the second bullet on page 5, and suggested striking “...and induce inflammation of the brain.” The four experiments listed speak nothing about experiments in the brain nor does the description of the results that follow in the next bullet include it. She felt it was important and she suggested expanding and describing some of the studies he did talk about regarding inflammation in the brain later.

Mr. Hayes suggested removing from the second bullet, the words “and induce inflammation in the brain.” Also, strike the comma after allergies; revised to read, “...can exacerbate airways allergies and promote development...” The new bullet would read, as follows:

- **Dr. Kleinman described results of a series of experiments in which he found that the semi-volatile components of PM2.5 and UFP can exacerbate airway allergies and promote development of cardiovascular disease. The findings of these experiments include the following:**

Dr. Vura Weis referred to the next bullet; “These results suggest that” and asked that the second sub-bullet should read, “~~Increases~~ Decreases in heart rate variability and an increased aortic plaque buildup with UFP exposure...”

Mr. Bramlett referred to the four results listed on pages 5 and 6, and asked that the 4th sub-bullet include the word “downwind” in each parenthesis, to read:

- **“Very near roadway exposures to UFP (~50 meters downwind) can induce airway allergies, but these effects drop to below statistical significance at greater distances (~ 150 and ~ 250 meters downwind) due to dilution and particle conversion.”**

Mr. Hayes asked for comments on page 7; Joint Panel Discussion to which there were none. He referred to “Emerging Issues from the Advisory Council” and asked for comments.

Ms. Lutzker said she believes number 1 was contrary to the last bullet of the Joint Panel Discussion. It seems Dr. Ayala was saying we do not need to worry so much about how UFP differs from PM2.5; what we do for PM2.5 will affect UFP. But the emerging issue states we need to study this more. Dr. Bornstein said they disagreed on that point, and perhaps this needs to be built into it. Ms. Lutzker suggested including a reference that Dr. Ayala felt this way or some other inclusion or reference. Mr. Hayes agreed that UFP by itself could be a real problem and the Council saw disagreement with that between the two speakers. Ms. Lutzker suggested starting the last bullet under Joint Panel Discussions with “Dr. Ayala suggested that nothing that we have learned...”

Mr. Bramlett said he thinks both of their statements align with their role with what they do day in and day out and suggested more sophisticated language. Dr. Vura Weis suggested adding the word, “yet” in the last bullet, to read “Nothing we have learned yet about UFP suggests...”

Mr. Kurucz said bullet 5 under Emerging Issues on page 8 has a caveat which states exactly what the Council is talking about and he suggested moving it up as the first point. Council Members agreed. The Council agreed to move bullet 5 to be the first bullet point, and renumber the others as follows:

- 1. Nothing we have learned about UFP suggests that the current control of PM2.5 is going in the wrong direction. We need to stay the course, including removal of older and gross polluting vehicles and replacement of conventional internal combustion engines ~~traditional gasoline engine~~ (See Bolles’ comment on page 8) with hybrids, fuel cells, and cleaner fuels (hydrogen, natural gas, bio fuels). We should however be wary of strategies that might decrease PM2.5 mass emissions but would increase particle number or surface area metrics.**
- 2. The interrelationships between....**

Ms. Bard referred to the previous section under Dr. Michael Kleinman, page 6, and Ms. Lutzker’s comment about brain injury to ensure they captured everything. She said there are three bullets related to brain exposures and issues. What she did not see captured was that on page 11 of the minutes where Dr. Kleinman calls out where the linkage to the central nervous system raises serious concerns. She suggested the second bullet point and the examples might be added to page 6 in-between the third and fourth bullet points (before “Oxidative stress”) and ensure they are also covered under the recommendations, as follows:

- **The transfer of inhaled fine and ultrafine particles into the brain raises serious concerns, for example:**
 - **for individuals exposed in regions with high concentrations of these particles, i.e. near heavily trafficked roads,**
 - **near pollutant sources and in some workplaces during the manufacture or application of numerous industrial and commercial products that contain nanomaterials.**

Mr. Lutzker referred to number 6 under Emerging Issues on page 8. It states that “UFP nitrates, sulfates, and metals may not be as toxic for those effects but might have other toxic effects.” Number 7 talks about toxic effects of metals.

Mr. Hayes noted he discussed this with Dr. Kleinman about this who told him that the studies he had done to look at allergic effects when he exposed mice downwind from a freeway, when he looked at denuded and un-denuded particles and the fact that denuded particles which govern the semi-volatiles by heating them did not have the same level of toxic effect as un-denuded particles coated. The indication is that metals which would stay with the core of the particle were not that big of a deal. He then came back and said, but there are other inputs. This is true of UFP and allergic effects, but not necessarily true for other things. The red comments in the draft report are based on Dr. Kleinman’s review.

Ms. Lutzker asked if some metals would stay on or would some get denuded. Mr. Hayes said metals would stay with the core. For allergic effects, it is not a big deal. But metals have been implicated in fine particles.

Dr. Bornstein suggested that Number 6 should say “UFP nitrates and sulfates may not be...” and metals can be covered in number 7 which seems more consistent. Ms. Lutzker commented that the metals are not specified, as it states “most adverse health impacts”.

Upon further discussion, the Council agreed to amend page 8, numbers 6 and 7 as follows:

- 6. Semi-volatile hydrocarbon constituents (unburned or partially burned fuel and lube oil) are associated with some of the most adverse cardio vascular and pulmonary health impacts. UFP nitrates, sulfates, and metals may not be as toxic for those effects but might have other toxic effects. While the Europeans are focused on total number of solid UFP, ARB is keeping the focus on the semi-volatile UFP as well.**
- 7. The role of metal and metal oxide UFP in producing adverse biological (e.g. neurological) responses from UFP exposure needs to be better understood.**

Dr. Vura Weis commented there are also carcinogenic effects from some of these pollutants and she was not sure if Dr. Kleinman covered them. Dr. Bornstein suggested this be covered in the recommendation; “Although not discussed, there are also carcinogenic effects from some of these pollutants.”

Mr. Bolles referred to Number 5, stating Dr. Kleinman's final point transitioned away from traditional internal combustion engines in Number 1 (the old Number 5 from page 8). He suggested replacing "traditional gasoline engine" with "**traditional internal combustion engines**" to be consistent.

Mr. Bramlett referred to page 7, the new Number 3 (old Number 2); "Measurements of UFP that correlate better with public health than particle number are needed." He stated public health is overly broad and suggested replacing it with "the public health impact, outcome or indicators".

The new Number 3 should read:

- 3. Measurements of UFP that correlate better with the public health impact than particle number are needed. Better tools are needed to assess UFP exposure, particularly on and near heavily-traveled roadways.**

Ms. Bard asked to add an additional number under Emerging Issues to tie together the bigger picture on health impacts and the need for policy. She asked that the following be inserted as Number 9 and Council Members held discussion on roadway problems and dispersion of UFP:

- 9. Growing research on unique health impacts of near roadway UFP exposure to reduce exposures in new developments as well as among existing populations, as well as among existing populations located near heavily traveled roadways.**

Chair Blonski thanked Mr. Hayes for running the meeting. Mr. Hayes recognized Mr. Altshuler and subcommittee members for working on the report.

Excused

Mr. Hayes was excused from the meeting at 9:40 a.m.

Chair Blonski questioned the date of the Board presentation, and Mr. Kendall stated the date was changed from December 21, 2011 to December 7, 2011; however, this could change again. Chair Blonski stated Mr. Hayes has offered to present the report, and he also invited others, as well. Council Members discussed the amount of time provided for the presentation, and Ms. Roggenkamp suggested aiming for 15 minutes.

Dr. Vura Weis questioned updates of the PowerPoint presentation, and Mr. Altshuler felt one report needed to be done that covers the three with a team approach to include some public health expertise, himself, and Mr. Hayes. Dr. Bornstein stated he is familiar with the atmosphere, and someone will be needed to cover public health. Dr. Vura Weis and Liza Lutzker offered to assist. Mr. Kendall stated the Final Report would be needed one to two weeks prior to the presentation to the Board.

Chair Blonski verified that the three presenters should review the Draft Report, work through Eric Stevenson on submitting and finalizing the 15-minute PowerPoint presentation. Mr. Altshuler asked that the updated Draft Report be emailed to all Council Members.

The Council clarified that the presenters will be Dr. Bornstein, Ms. Lutzker, Dr. Vura Weis and Mr. Altshuler. It was stated that the Final Report is needed by November 28, 2011 and the PowerPoint by November 30, 2011. All input should be sent to Eric Stevenson by November 14, 2011 and this will be forwarded to the presenting group. Chair Blonski agreed to introduce the team of presenters and invited authors and any other Council Members to attend the meeting, as well.

Council Members then discussed “Advisory Council Recommendations”.

Dr. Bornstein asked for consistency in the use of “Air District” or “District”. He referred to Number 2 and said he was part of the Bay Area Modeling Advisory Committee and they are holding a meeting and presenting their report dealing with PM2.5 called, *Health Impact Analysis of Fine Particulate Matter in the San Francisco Bay Area*.

Dr. Bornstein believed that Numbers 2’s sentences were similar to each other and suggested it be amended to read, **“We recommend that the District continue its proactive stance on UFP and endorse its efforts to integrate UFP considerations into PM2.5 planning.”**

Dr. Bornstein referred to Number 3-d and recommended it be stricken.

Mr. Lucks referred to Number 3-a. He said it seems what is covered jurisdictionally is something not in the province of stationary sources. The Air District does not have much control over emerging technologies of mobile sources. He suggested adding some text to Number 3-c to underscore the critical importance of collaboration, as follows:

c. Collaborate with Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) to educate the public on the public health effects associated with on road and near road UFP and PM2.5 exposures.

Mr. Lucks said at that last meeting, the Advisory Council discussed the leadership at the South Coast AQMD, and that the Council should collaborate with them given these are the two districts in the state taking a leadership role in UFP.

Mr. Altshuler noted that a Public Health Officer was recommended earlier in the year and he suggested building on that to get some intercommunication with the South Coast. Mr. Lucks agreed that a Public Health Officer could serve as a liaison to share research and strategies with the South Coast.

Ms. Lutzker questioned whether a Public Health Officer was required to be a physician, and Dr. Vura Weis stated that in most cases the position is a physician. However, she was not sure this was true everywhere. She suggested it be called a *Health Officer*.

Council Members suggested the added bullet read, “Prioritize the hiring of the Health Officer position whose mission among other duties would be to collaborate with the South Coast Air

Quality Management District in studying and addressing UFP health impacts and fashioning effective public health policy strategies.”

Ms. Lutzker stated she thinks some of the recommendations about collaborations with South Coast AQMD were not specific about health effects, but the way that monitoring is being set up and the way they are addressing it through other policy. She questioned whether the Council was combining two recommendations together; one that there be a Health Officer who deals with these effects and hopefully collaborates with South Coast AQMD, but also that this Air District collaborate.

Dr. Vura Weis suggested, and Council Members agreed, for the bullet to be reworded to read,

Collaborate with South Coast AQMD and other air districts or agencies in studying UFP health impacts and fashioning effective public health policy strategies. This could be made more effective by filling the Health Officer position.

Mr. Kendall suggested providing emphasis by having the statement as one of the recommendations instead of a sub-bullet point under Number 3.

Dr. Vura Weis said an over-arching recommendation is reducing vehicle miles traveled, and she was not sure this deserves separate mention or whether it should be included in the new number above after “agencies” to “reduce vehicle miles traveled”. The other is to continue to pay special attention to seriously impacted communities and vulnerable populations and decrease additional pollution in these areas. Mr. Lucks suggested appending it to the new Number 3-c because this is the province of ABAG and MTC.

3e. Collaborate with Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) to educate the public on the public health effects associated with on road and near road UFP and PM2.5 exposures and to promote strategies to reduce vehicle miles traveled.

Dr. Vura Weis suggested adding the seriously impacted communities to Number 3, as well. Ms. Bard suggested this be added as new sentence under Number 3-d, to read, “Focus policy development on vulnerable populations in high impact areas.”

3d. Be prepared to make “mid-course corrections” to PM reduction efforts in the Bay Area, if necessary based on on-going UFP research developments. Focus policy development on vulnerable populations in high impact areas.”

Ms. Lutzker said in continuing to look at this sentence, the Council would want the District to collaborate on not just the health effects and policy but also on UFP in general. She suggested another amendment to Number 3-c to read:

3c. Collaborate with Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) in studying UFP measurement, health impacts, fashioning effective public policy strategies to reduce exposures, educating the public on

public health effects associated with on road and near road UFP and PM2.5 exposures, and to promote strategies to reduce vehicle miles traveled.

Mr. Kurucz referred to Number 4-c and moving “chemical composition” to Number 5 before the words “ambient air levels”, to read:

5. **“We recommend that the District continue its efforts to characterize UFP sources, chemical composition, and ambient air levels in the Bay Area.”**

Mr. Kurucz and the Council agreed for Number 4-c to be deleted and that a and b merge together to be one paragraph for Number 4.

Ms. Bard referred to Number 3-d and asked that “to reduce exposures” be inserted before “,educating the public”.

Mr. Stevenson referred to Number 5-b, and asked to include something that indicates “as resources allow”. Ms. Bard suggested amending the item as follows:

- b. We recommend that the District consider conducting short-term intensive UFP monitoring as resources allow to characterize ambient UFP levels....”**

The Council concluded amendments to the Draft Report.

3. Discussion, Recommendation and Selection of Slate of Officers for 2012

Chair Blonski discussed and confirmed Mr. Hayes’s and Dr. Bornstein’s interests in serving as Chair and Vice Chair, and invited Council Member interest and discussion.

Ms. Bard suggested nomination of members Liza Lutzker, Gary Lucks, and Jonathan Ruel to serve as Secretary. All members declined due to previous commitments.

Ms. Bard made a motion to approve the proposed Slate of Officers for 2012: Stan Hayes as Chair, Dr. Bornstein as Vice Chair, and Sam Altshuler as Secretary. The motion was seconded by Dr. Holtzclaw; carried unanimously without objection.

OTHER BUSINESS

4. **Chairperson’s Report** - Chair Blonski announced there is no December meeting. He thanked all members for their work over the year.
5. **Council Member Comments/Other Business** - Dr. Holtzclaw reported Australia has passed a \$23 a ton tax on CO2 emissions which is now a worldwide precedent. Australia has the highest GHG rate per capita, primarily because of their coal firing power plants and livestock.
6. **Time and Place of Next Meeting** – Wednesday, January 11, 2012, at 939 Ellis Street, San Francisco, CA 94109.

7. **Adjournment** – Chair Blonski adjourned the meeting at 11:38 p.m.

/s/ Lisa Harper

Lisa Harper
Acting Clerk of the Boards