BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

ADVISORY COUNCIL MEETING

WEDNESDAY
OCTOBER 10, 2012
9:00 A.M.

7TH FLOOR BOARD ROOM
939 ELLIS STREET
SAN FRANCISCO, CA 94109

AGENDA

CALL TO ORDER

Opening Comments — Stan Hayes, Chairperson
Roll Call — Clerk of the Boards

PUBLIC COMMENT PERIOD

Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3. *The public has the opportunity to speak on any agenda item. All agendas for Advisory Council meetings are posted at the District, 939 Ellis Street, San Francisco, at least 72 hours before a meeting. At the beginning of the meeting, an opportunity is also provided for the public to speak on any subject within the Council's purview. Speakers are limited to three minutes each.*

CONSENT CALENDAR

1. Approval of Minutes of the July 11, 2012 and the September 12, 2012 Advisory Council meetings.

DISCUSSION

2. Approval of draft report of the Advisory Council's September 12, 2012 meeting.

   The Advisory Council will discuss the draft report of the September 12, 2012 meeting on Ultrafine Particles: Reducing Exposure.

OTHER BUSINESS

3. Council Member Comments/Other Business

   Council Members may make a brief announcement, provide a reference to staff about factual information, or ask questions about subsequent meetings.

4. Time and Place of Next Meeting

   Wednesday, November 14, 2012, at 9:00 a.m. at 939 Ellis Street, San Francisco, CA 94109.

5. Adjournment

CONTACT EXECUTIVE OFFICE - 939 ELLIS STREET SF, CA 94109 **(415) 749-5130**
FAX: (415) 928-8560
BAAQMD homepage:
www.baaqmd.gov

- To submit written comments on an agenda item in advance of the meeting.
- To request, in advance of the meeting, to be placed on the list to testify on an agenda item.
- To request special accommodations for those persons with disabilities notification to the Clerk's Office should be given in a timely manner, so that arrangements can be made accordingly.
- Any writing relating to an open session item on this Agenda that is distributed to all, or a majority of all, members of the body to which this Agenda relates shall be made available at the District's offices at 939 Ellis Street, San Francisco, CA 94109, at the time such writing is made available to all, or a majority of all, members of that body. Such writing(s) may also be posted on the District's website (www.baaqmd.gov) at that time.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET, SAN FRANCISCO, CALIFORNIA 94109
(415) 771-4963

EXECUTIVE OFFICE:
MONTHLY CALENDAR OF DISTRICT MEETINGS

OCTOBER 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)* - **CANCELLED**	**Wednesday**	**3**	**9:45 a.m.**	**Board Room**
Advisory Council Regular Meeting *(Meets 2nd Wednesday of each Month)*	**Wednesday**	**10**	**9:00 a.m.**	**Board Room**
Board of Directors Executive Committee *(Meets 3rd Monday of each Month)* **- CANCELLED AND RESCHEDULED TO 10/22/12**	**Monday**	**15**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**17**	**9:45 a.m.**	**Board Room**
Board of Directors Public Outreach Committee *(At the Call of the Chair)*	**Thursday**	**18**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Executive Committee *(Meets 3rd Monday of each Month)*	**Monday**	**22**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Budget & Finance Committee *(Meets the 4th Wednesday of each Month)*	**Wednesday**	**24**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday of each Month)*	**Thursday**	**25**	**9:30 a.m.**	**4th Floor Conf. Room**

NOVEMBER 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**7**	**9:45 a.m.**	**Board Room**
Board of Directors Personnel Committee *(At the Call of the Chair)*	**Thursday**	**8**	**9:30 a.m.**	**4th Floor Conf. Room**
Advisory Council Regular Meeting *(Meets 2nd Wednesday of each Month)*	**Wednesday**	**14**	**9:00 a.m.**	**Board Room**
Board of Directors Executive Committee *(Meets 3rd Monday of each Month)*	**Monday**	**19**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Stationary Source Committee *(Meets the 3rd Monday of Every Other Month)*	**Monday**	**19**	**10:30 a.m.**	**4th Floor Conf. Room**

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NOVEMBER 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**21**	**9:45 a.m.**	**Board Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday of each Month)* **- CANCELLED**	**Thursday**	**22**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Budget & Finance Committee *(Meets the 4th Wednesday of each Month)*	**Wednesday**	**28**	**9:30 a.m.**	**4th Floor Conf. Room**

DECEMBER 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Special Meeting of the Board of Directors *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**5**	**9:45 a.m.**	**Meeting Location:** Hilton Garden Inn 1800 Powell Street Emeryville, CA 94608 **Tour Location:** Pacific Steel Casting 1333 2nd Street Berkeley, CA 94710
Board of Directors Executive Committee *(Meets 3rd Monday of each Month)*	**Monday**	**17**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**19**	**9:45 a.m.**	**Board Room**
Board of Directors Budget & Finance Committee *(Meets the 4th Wednesday of each Month)*	**Wednesday**	**26**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday of each Month*	**Thursday**	**27**	**9:30 a.m.**	**4th Floor Conf. Room**

AGENDA: 1

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Hayes and Members
of the Advisory Council

From: Jack P. Broadbent
Executive Officer/APCO

Date: September 17, 2012

Re: Draft Minutes of July 11, 2012 and September 12, 2012 Advisory Council Meeting

RECOMMENDED ACTION:

Approve attached draft minutes of July 11, 2012, and September 12, 2012, Advisory Council meetings.

DISCUSSION

Attached for your review and approval are the draft minutes of the July 11, 2012, and September 12, 2012, Advisory Council meetings.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Sean Gallagher
Reviewed by: Ana Sandoval

Attachment

AGENDA: 1

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

DRAFT MINUTES

Advisory Council Regular Meeting
9:00 a.m., Wednesday, July 11, 2012

CALL TO ORDER – ROLL CALL

Chairperson Stan Hayes called the meeting to order at 9:05 a.m.

Present:	Chairperson Stan Hayes; Vice-Chairperson Robert Bornstein, Ph.D.; Secretary Sam Altshuler, P.E.; and Council Members Louise Bedsworth, Ph.D., Benjamin Bolles, Harold Brazil, Jonathan Cherry, John Holtzclaw, Ph.D., Gary Lucks, J.D., Liza Lutzker, Kathryn Lyddan, Jessica Range and Dorothy Vura-Weis, M.D., M.P.H.
Absent:	Council Members Jennifer Bard, Jeffrey Bramlett, Kraig Kurucz, Jane Martin, Dr. P.H., Estes Al Phillips and Murray Wood.
Also Present:	None.

OPENING COMMENTS

Chairperson Hayes thanked the Council Members for attending despite the challenges of the season and the day and asked that they be mindful to utilize the microphones provided.

PUBLIC COMMENT PERIOD

None.

CONSENT CALENDAR

1. Approval of Minutes of the June 13, 2012, Advisory Council Regular Meeting

Member Altshuler requested an amendment to those portions of the minutes that refer to "Guidelines" such that "CEQA" be inserted in advance of each instance, starting at page 8.

Council Action:

Member Altshuler made a motion to approve the minutes of June 13, 2012, as amended. Member Bornstein seconded the motion. The motion was unanimously approved without objection.

DISCUSSION

2. Discussion of revised draft report on the Advisory Council's May 9, 2012, meeting on Ultrafine Particles: Exposure Assessment

Chairperson Hayes made introductory comments and thanked the members of the report-drafting committee for their efforts. Member Cherry made introductory comments regarding revisions since the last meeting and invited input from Members on sections within the report. Members provided the following comments:

Regarding report section entitled, "Summary"

None.

Regarding report section entitled, "Key Points"

Member Lutzker suggested, regarding the "Note," the insertion of "convenience" before "samples" as it effects the representativeness of the information. Member Bornstein suggested there was also a small number of studies and a small number of people. Member Altshuler suggested "limited" and Chairperson Hayes suggested "a limited number." Member Lutzker clarified that her focus was on the addition of "convenience" as the sampling was not done in a methodologically sound manner and the conclusions that may be drawn are somewhat limited as a result. Chairperson Hayes suggested insertion of "limited number of" before "studies," repeated Member Lutzker's revision and suggested replacing "represent" with "consist of."

Member Altshuler noted the text is rendered in bold at various points throughout the document and asked if it is intentional and about its meaning. Member Cherry responded that it is intentional and provided to assist readers in finding the main points but can be removed if that is the Council's preference. The Council discussed the utility of the formatting and the consensus opted for it to remain.

Chairperson Hayes said this report is the first to include editorial comments about presentations and asked if it is a precedent the Council wants to establish. Member Bornstein agreed and suggested a Key Point or Emerging Issue be added that explains there are relatively few studies in this area. Member Range partially agreed with Chairperson Hayes but noted that Dr. Nazaroff made the same point in his presentation. Member Bornstein suggested attributing the Note to Dr. Nazaroff. Member Lutzker said that it should not be limited to Dr. Nazaroff as it applies to both presentations but adding it to Emerging Issues is acceptable. Member Bornstein said this is a recurring issue for the Council that may deserve greater attention for future reports. Chairperson Hayes said the Note paragraph should be inserted as the first item under Emerging Issues and "Note" should be deleted.

Regarding report section entitled, "Key Points – Dr. Lynn M. Hildemann"

Member Altshuler suggested these presentations represent the first time the Council received information it felt did not make sense, it is not acceptable for the Council to rubber stamp all that it receives, and the editorial comment is a way of addressing this issue by adding value. Member Bolles agreed. Member Bornstein said the Council is free to exclude items that do not make sense and suggested it is the duty of the Council to remove anything of that nature from Key Points.

Member Altshuler said he is troubled by the information about smoking outside next to a roadway, the data was totally useless yet included in the report, and now the Council is working on the proper method to discredit the statement. The Council decided the item for discussion is bullet 5, sub-bullet 2. Member Lutzker asked which specific part seems inaccurate. Member Altshuler said it dilutes prior reports from the Council regarding roadside exposure by saying that smoking is worse. Member Lutzker responded the message is not diluted but modified such that the smoking message is elevated. Member Altshuler said the study suggested the ultra-fine particulates (UFP) from motor vehicles is not significant, running counter to all that has been heard by the Council in prior presentations. Member Range said the bullet point was already revised in an effort to address that very aspect, suggested it is much improved and noted the bullet point is the reason for the Note in the first place. Member Bornstein suggested deleting the last sentence and making slight modifications to the language preceding it. Chairperson Hayes clarified that the presentation concluded that traffic from a heavily travelled roadway is as bad as cigarette smoke. Member Bornstein said the objection is UFP from traffic is downplayed as being similar to cigarette smoke. Member Range said two studies were presented, the first showing that smoking is greater than roadway, the second showing the two as roughly equal, and both were followed by Dr. Hildemann's hypothesis that the second study involved traffic with a much greater percentage of heavy duty trucks. Chairperson Hayes said this represents a significant take-home message and the Council should clarify the meaning. Member Range said it is inconclusive because two different studies show two different results. Member Bornstein suggested inserting "that could be" before "of similar magnitude." Member Lutzker said the low-traffic was less and the high-traffic was more than smoke, suggested no revision is necessary but for the addition of the sentence, "This underscores the importance of UFP exposure both from secondhand smoke as well as heavily travelled roads" or in reverse order, as the Council prefers. Member Bornstein said that Member Altshuler did not trust the conclusion drawn but that does not seem to be the sentiment of all the Council Members. Member Altshuler agreed with Member Lutzker's suggested revision and suggested inserting "potential" before "importance" in the newly added sentence.

Chairperson Hayes asked if this is the final decision of the Council as it seemed Dr. Hildemann was speculating about this conclusion. Member Bolles agreed with Member Altshuler. Member Lucks said he is in favor of Member Lutzker's suggested sentence as the health consequences of each pollutant are not mutually exclusive. Member Bornstein agreed also, suggested removing "In the two studies presented" and inserting "two" before "outdoor studies" and merging the second and third sentences by replacing the "." after "smoke" with ", while" and inserting ", while along roadways with fewer heavy duty trucks UFP generated from cigarette smoke" before "was much greater." Member Lutzker restated the final sentence for insertion as, "This illustrates the potential importance of UFP exposure from both secondhand smoke as well as heavily travelled roads."

Member Holtzclaw suggested the readership would benefit from receiving the information provided by the speakers about the dynamic nature of UFP and requested a statement be inserted to that end as sub-bullet three under bullet five. Member Bornstein suggested revising the first bullet to expand the scope beyond air circulation patterns alone, to also include dilution levels and perhaps coagulation. Member Holtzclaw suggested including a comparison to fog and rain droplets. Member Bornstein said coagulation is the missing process and asked where it belongs. Member Range said it is in the second bullet on page two. Member Holtzclaw again recommended the inclusion of a fog-rain example. Member Bornstein suggested adding "like with fog droplets" to bullet two. Chairperson Hayes said the bullet seems sound without revision. Member Bornstein said perhaps it is too technical and would benefit from an analogy. The Council discussed the proper language and analogy. Member Vura-Weis recommended "combine" instead of "coagulate" in light of the intended readership, urged the Council to remember that the individual reports will likely be used to generate the final, combined report and thusly, repeated foundational statements are probably unnecessary in each of the separate reports, and agreed with Member Holtzclaw's suggested addition.

Member Altshuler said that the science of UFP dates as far back as the 1960s, that he has issue with nearly everything attributed to Dr. Hildemann, the Council knew going into the review process that this topic would not be an easy one, various aspects of Dr. Hildemann's research methods are questionable, the really valuable information is contained in the first four bullets, and the research of cigarette smoke and motor vehicle emissions was too casual in nature to attribute value to. Member Bolles stated that he is not a scientist and agrees. Member Altshuler clarified that he is not downplaying the health consequences of either source and is not advocating on behalf of either group but the data is not quantified. Member Bornstein said it is worth keeping in as currently stated as undue weight was not attached nor were numbers provided. Member Bedsworth suggested the addition of a sentence regarding the findings being limited and more studies can come later. Member Bornstein said that is something for Recommendations. The Council discussed possible ways to revise the bullet. Chairperson Hayes suggested taking it out entirely or leaving it as previously amended today.

Member Vura-Weis noted the Council is not focusing on the additive nature of the two sources and the fact that those exposed to both are getting a double dose, lending to the importance of making mention of both. Member Bornstein suggested including something on the additive nature. Member Lutzker said the sources are at least additive, it may actually be more. Member Altshuler suggested that aspect to be an Emerging Issue. Member Vura-Weis said these are exposure studies, not health effect studies, and questioned what the literature says about the effects of each alone or in combination.

Chairperson Hayes suggested explicitly attributing the two studies to Dr. Hildemann and agreed with Member Altshuler's assessment that the studies were somewhat anecdotal. The Council discussed the same. Member Bornstein suggested characterizing the studies as "exploratory" and Chairperson Hayes agreed with inserting "exploratory" in the revised language.

Eric Stevenson, Director of Technical Services, reminded the Council of the outstanding "coagulation." Member Bornstein urged the use of "coagulated (i.e. combined to form larger PM)."

Member Range said that all of the studies were of the same caliber and that was the Council's reasoning for the placing the Note at the beginning of Key Points. Member Bornstein said that Dr. Nazaroff's studies were more quantitative so perhaps varied notes before each speaker's name are appropriate. Member Range reminded the Council that Dr. Nazaroff stated that conclusions should not be drawn from the presentations and the Note should stay at the front of Key Points. Member Bornstein suggested that two Notes be drafted and it be made clear that the Council is not saying there are others that are better but that there are none and the presentations are the best available on these emerging issues. Member Lucks agreed and suggested the statement should be a blanket qualifier at the beginning of the report. Member Bornstein agreed. Chairperson Hayes reiterated his discomfort about editorializing information received by the Council as an opening to the report and the precedent established. Member Lucks suggested noting it is the Council's understanding. Member Range suggested the substance of the Note is itself a Key Point brought up by each speaker. Member Vura-Weis said that if they both said it then an attribution is appropriate and it relieves the Council from the appearance of criticizing the exploratory work done. Member Bedsworth said it is important that the Council does not appear critical of one of the two highly-respected speakers and a general statement is appropriate. Chairperson Hayes asked if any Council members recall Dr. Hildemann making the same comment. Member Lyddan noted her lack of understanding at the time of the presentations that the speakers were pioneers in a cutting edge field and context in this regard is important to provide for readers. Member Altshuler made a motion for deletion of bullet 5, sub-bullet 2, as it was neither the subject of the presentation nor the intended topic in the Council's invitation. Member Bornstein asked if the study had been published. Chairperson Hayes noted the lack of a second to the motion and asked how the Council would care to proceed with the proposed revisions. Member Bornstein recommended a blanket statement at the beginning of the report. Chairperson Hayes suggested use of the phrase, "we understand that." Member Bedsworth suggested, "The Council's understanding, based on the speakers' presentations, is that these results represent the early stages of research in this area." The Council discussed the best wording. Member Bornstein suggested sending the final version to the speakers for approval. Chairperson Hayes said the Note will come back out of Emerging Issues into Key Points and be revised. The Council asked Mr. Stevenson to read back the most recent iteration of the Note. Mr. Stevenson said, "Both speakers emphasized that the limited number of UFP studies generally represent small convenience samples." Member Bornstein said that "necessarily" needs to be included. Mr. Stevenson said, "Both speakers emphasized that the limited number of UFP studies discussed necessarily represent small convenience samples." Member Vura-Weis suggested insertion of "exposure" before "studies." Chairperson Hayes agreed. Member Vura-Weis suggested the insertion of "Until confirmatory studies are available," before "Broad extrapolation is not warranted." Chairperson Hayes disagreed. The Council discussed the proper wording. Member Vura-Weis questioned the need for the last sentence. Chairperson Hayes suggested inserting "For example" at the beginning of the sentence. Member Bornstein questioned the continued use of the sentence. Chairperson Hayes said to insert "For example" at the beginning of the sentence and to delete everything after "occupants."

<u>Regarding report section entitled, "Key Points – Dr. William W. Nazaroff"</u>

Member Lutzker suggested, regarding bullet 1, the insertion of "single family" before "homes" and, regarding bullet 3, sub-bullet 1, replacing "incense" with "terpine-based cleaning products."

Member Bornstein suggested, regarding bullet 3, sub-bullet 2, replacing "The vast majority of these" with "Most." Chairperson Hayes said to delete "vast" instead.

Member Lutzker suggested, regarding bullet 4, sub-bullet 4, the insertion of "and staff" after "children" because approximately 10% of all cases of work-related asthma result from cleaning product use. Member Bolles noted that information relative to work-related incidences of the onset of asthma was lacking from the presentation and part of the reason the studies seemed so casual. Member Lutzker clarified the statistics are not specific to UFP exposure and noted that of those 10%, 80% are bystanders rather than users. Member Altshuler asked how to include this information in the report. Member Lutzker said that she has some suggestions for Recommendations. Member Vura-Weis said the addition represents a logical step and not that which was presented and should be excluded. Chairperson Hayes said to insert "and staff."

Member Bornstein suggested, regarding bullet 4, that the exceptions listed do not flow naturally. Member Cherry suggested replacing the parenthetical portion with "except for custodial activities." Member Altshuler noted the portion of the presentations regarding cafeteria activity that may include the pancake cooking portion. The Council discussed a possible revision. Chairperson Hayes said to replace the parenthetical portion with "except for cooking and custodial activities."

<u>Regarding report section entitled, "Emerging Issues"</u>

Member Range said, regarding number 1, that her notes say "85%" instead of "89%" and inquired whether any other Members had notes on this point. Member Lutzker and Chairperson Hayes each responded that they have heard from other sources that it is approximately 90%. Member Cherry noted that the minutes read "89%." Members Bornstein and Altshuler discussed alternative language. Member Bornstein suggested replacing the "." after "outdoors" with ",", replacing "According to Dr. Hildemann" with "as" and inserting "at least" before "89%." Member Vura-Weis expressed her discomfort with "at least." Member Lutzker suggested "approximately" instead. Chairperson Hayes read the proposed revision. Members Bornstein and Vura-Weis suggested "about" instead of "approximately." Member Cherry and Chairperson Hayes opted for "approximately 90%."

Member Lutzker asked, regarding number 4, if the insoluble particles are UFP or if all UFP are soluble and suggested that if the insoluble particles are UFP that "UFPs" replace "particles."

Chairperson Hayes suggested, regarding number 4, insertion of ", for example," after "suggested."

Member Lyddan asked about the structure of the report being prepared and discussed the same with Chairperson Hayes.

Member Bornstein suggested, regarding number 4, deleting "created." Chairperson Hayes alternatively suggested replacing "created equal" with "the same."

Regarding report section entitled, "Recommendations"

Member Lutzker said, regarding number 2.a, that landscaping practice is a method of reducing occupant exposure to UFP that was not brought up in these presentations but should be included by inserting "landscaping," after "siting." Member Range suggested moving "custodial practices" to a separate bullet, as it does not appropriately belong under ventilation and filtration methods, and include "landscaping" there. Member Cherry recalled the landscape presentation and suggested it goes more to design. The Council discussed the appropriate language and placement. Chairperson Hayes suggested that a new bullet point is unnecessary. Member Bornstein asked why "high MERV value" and "HEPA filtration" are conjoined by "and." The Council discussed the wording used in the Glossary. Member Cherry suggested inserting "through effective fine filtration such as" before the phrase in question. Mr. Stevenson explained the difference in the systems. Member Bornstein and Chairperson Hayes suggested replacing the phrase in question with "high-efficiency filtration." Member Vura-Weis suggested instead defining the two terms in the Glossary rather than merely spelling out the acronym. Chairperson Hayes said to delete "high MERV value or HEPA filtration" and insert "high-efficiency filtration" and strike the definitions for MERV and HEPA from the Glossary, provided each is not used elsewhere in the report.

Member Altshuler suggested, regarding number 3.a and b, removing the semicolons and breaking up the paragraphs into sub-bullets. Member Bornstein said the substance of the paragraphs do not immediately lend themselves to bullet points. Members Bedsworth, Bornstein and Lutzker discussed possible formatting. Chairperson Hayes urged for the formatting to remain without sub-bullets. Member Vura-Weis agreed with Member Altshuler. Member Bornstein was tasked with reformatting the paragraphs during final review.

Member Altshuler recalled the discussion from the last Council meeting regarding shelter-in-place, suggested the Air District review its shelter-in-place guidelines, and proposed the addition of a new number 4, "The Air District shall evaluate its shelter-in-place guidelines used during emergency situations and consider amending the same to direct the public to close windows, turn off fans, avoid smoking, cooking, use of candles and cleaning supplies during a shelter-in-place event." Chairperson Hayes asked if this suggestion is relative to the Air District's emergency response. Member Altshuler said there is a connection as a shelter-in-place notice directs people to stay indoors and without additional guidelines there may be unintentional exposures to UFP that could be avoided.

Member Bolles asked if the limonenes and terpenes are causing the 10% of all cases of work-related asthma said to result from cleaning product use.

Chairperson Hayes said, regarding Member Altshuler's suggestion, that the recommendation makes sense but the focus in that situation is minimizing infiltration of hazardous materials from outdoor sources rather than UFP. Member Altshuler said this is a two-part issue, first whether the guidelines provide information on minimizing indoor infiltration of hazardous materials from outdoors, and second, what, if any, direction is provided relative to indoor generation of UFP when ventilation is not viable. Chairperson Hayes said he is uneasy about making a recommendation in light of the limited amount of information the Council has relative to the effects of short-term exposure to UFP. Member Altshuler suggested that at least the first part relative to minimizing infiltration is important. Chairperson Hayes said that the guidelines likely

already provide that basic information. Mr. Stevenson offered to research the wording of the current guidelines.

Member Bolles restated his inquiry regarding limonenes and terpenes. Member Lutzker said the two substances are not themselves responsible for causing all of the work-related asthma attributed to cleaning product use, there are many respiratory irritants in cleaning products, various efforts are underway to limit or eliminate the problem ingredients, and urged explicitly acknowledging that terpenes are respiratory irritants and Recommendation number 3.a be revised to encourage the education of employers, purchasers and suppliers of cleaning products instead of those with the occupational exposures. Member Altshuler asked what the material safety data sheets (MSDS) say for these products. Member Lutzker responded that the MSDS should say that they are respiratory irritants. Member Altshuler asked if that registers with users. Member Lutzker asked how many people read them generally and suggested it is very few people. Chairperson Hayes called for suggested language. Member Lutzker suggested inserting "and are also themselves respiratory irritants" after "formaldehyde." Chairperson Hayes agreed. Member Lutzker further suggested inserting "Educate and work with employers and manufacturers and suppliers of cleaning products to switch to non-scented and safer alternatives" under the new education bullet to be formed from number 3.a. Member Bornstein asked if this is a proper Recommendation to be made to the District. Member Lutzker said if you are educating employees then why not educate employers as well. Chairperson Hayes said the point of this Recommendation set is to integrate information on UFP into things the Air District is already doing. Member Lutzker agreed and noted there is a sense among many that clean has a certain smell when, in fact, clean has no scent and the associated smell is generally that of a cleaning product. Chairperson Hayes and Member Lutzker discussed the need to retain the phrase regarding education of employees. Member Lutzker said that if a recommendation to employees is retained it should be geared towards recommended use of the products and the importance of visiting a doctor should symptoms arise, continued to urge a Recommendation to employers, and conceded that this may not be the proper place to make a recommendation to manufacturers and suppliers. Member Holtzclaw suggested including a recommendation to the public in light of Member Lutzker's comment about smells and expectations relative to the same. Member Lutzker agreed and suggested two education bullets, one for employers that reads "Educate employers about switching to non-scented and safer cleaning products" and another for employees and the public under the bullet including "If using such products…" that reads "Educate the public and those with occupational exposures to these cleaning products concerning their proper use." Members Lutzker and Bornstein discussed possible additional points that could be added as sub-bullets to provide increased clarity. Chairperson Hayes noted the interesting nature of the sub-bullets regarding proper use but questioned the need for their inclusion. Member Lutzker said that if proper use is going to be recommended it seems natural to provide some information in that regard. Member Bornstein suggested allowing the Air District to generate the details. Chairperson Hayes said to delete the end of number 3.a, starting with "Use the right amount…" Members Lutzker and Bornstein discussed the revised formatting and need to retain the portion about ozone.

Member Holtzclaw asked if the agents do anything in the cleaning products beyond scenting. Member Lutzker said they do contribute to the cleaning function for cleaning products but not for air fresheners.

Chairperson Hayes said to leave the sentence intact which begins "Avoid using these products…"

Member Altshuler said the report has veered away from focusing solely on the UFP issue and is instead looking at indoor air quality more generally. Member Lutzker agreed but suggested the recommendation will apply to both UFP and indoor air quality generally. Member Altshuler agreed but noted the infiltration of a much larger topic that begs the question of where the report is headed. Members Bornstein, Lutzker and Cherry discussed the appropriateness and wording of the suggestion.

Chairperson Hayes said, regarding number 3.c, the language is not relative to a UFP issue nor is it crafted as a recommendation and asked if it belongs in Recommendations. Member Lyddan said that if made it should be revised to read as a Recommendation because it currently reads more like a directive than a Recommendation. Chairperson Hayes said he agrees with the statement but suggested it is redundant in light of how universally held the message already is. The Council agreed to remove the statement.

Chairperson Hayes noted that the Council would be wise to remember the need to tie back the Recommendations in this report to existing fine particulate matter ($PM_{2.5}$) programs at the District, as that connection is a primary goal of the Council process.

Jean Roggenkamp, Deputy Air Pollution Control Officer, suggested the connection be made to the District's particulate matter (PM) programs because of their greater scope.

Chairperson Hayes recommended the insertion of, "The Air District should continue to integrate UFP indoor and outdoor exposures and effects into the Air District's PM program." Various Council members suggested it be a new number 4.

Member Lutzker suggested, regarding 3.b, replacing "children" with "those", deleting "adults", and asked if the self-cleaning oven feature should be included. Member Range suggested replacing "or" between "stoves" and "ovens" with "," and adding ", and use of the self-cleaning feature in ovens" at the end of the sentence. Member Bornstein suggested that pilot lights in stoves and ovens is problematic. The Council discussed revised wording. Member Bornstein suggested revising the sentence to read, "from stoves or ovens with pilot lights and from self-cleaning features."

<u>Regarding report section entitled, "For Discussion at July 11th Meeting"</u>

Chairperson Hayes made introductory comments.

Member Bornstein asked if this is a topic that should be considered and discussed. Ms. Roggenkamp responded that the Council may issue a Recommendation on this topic but Air District staff will have to consider the timing of its implementation. Ms. Roggenkamp explained a delay is likely because the Council is significantly in front of general efforts in this subject matter area and the receptivity of others is unclear. Member Lucks asked if someone will be doing a primer on the California Environmental Quality Act (CEQA) for the Council's benefit. Ms. Roggenkamp said not today.

Member Lucks said the Air District has different tools at its disposal, including public education, regulation, allocation of grant money and planning/CEQA Guidelines, and although there is little or no foundation justifying the use of the other tools at this time, the Air District can inform other agencies that have no guidance on the connection between indoor and outdoor air quality by exploring an amendment to the CEQA Guidelines. Member Lucks suggested the Council may be best served by recommending "the Air District consider amendment to the CEQA Guidelines." Member Lucks relayed, as an example, that his child's school was recently rebuilt in a troubled zone and had the CEQA Guidelines provided the suggested information, then perhaps it would have affected the school's placement and design.

Chairperson Hayes agreed with Ms. Roggenkamp's assessment that the Council is out in front of the issue by a fair margin, noted both the difficulty in making a connection between health impact and exposure and that the same issue arose in the context of climate change, and suggested the topic be revisited in the future due to the lack of models to look to in crafting a Recommendation. Member Lucks said that many environmental analyses are in the gray areas, which experts will debate the details of, and suggested that the Air District does a disservice to the public by not passing along the information it has available for consideration even if it is not as conclusive as some would want. Member Range noted the presentations were regarding indoor air quality from indoor sources so the contemplated Recommendation does not seem to follow from the presentations, lead agencies are now looking at health effects from exposure to $PM_{2.5}$ and diesel PM where there is evidence linking health effects to roadways and other major sources, and her general agreement with Member Lucks but for the timing. Member Bedsworth said there is some regulatory precedent, and provided San Joaquin's requirement that schools not be cited near dairies, and that there are opportunities to insert this topic in the dialogue at the state level.

Mr. Stevenson said that regardless of whether a Recommendation on this topic is included in this report, the next speakers will be presenting on the topic of mitigation measures and may provide another opportunity to address this topic. Member Lucks asked what mitigation specifically. Mr. Stevenson responded that it will be more inclusive than UFP. Member Bolles said there is also the end of year wrap up. Chairperson Hayes said the Council will hear from the City and County of San Francisco on their mitigation strategies. Member Bolles noted the citing of a bike lane on the 101 Freeway in San Rafael. Member Lucks said he is open to timing the Recommendation differently but insisted it is an important item to address at some point, that the issue is greater than UFP, and that he does not want it to be lost.

Member Vura-Weis agreed that a review of CEQA is important as is greater inclusiveness. Member Altshuler said the Council has moved beyond the two presentations, suggested a motion to approve the report is in order pending a grammar review by Member Bornstein, and said the CEQA discussion is a separate one that has his support whether the recommendation comes in the form of a model ordinance, guidelines or otherwise.

Council Comments: None.

Public Comments: None.

Council Action:

Member Altshuler made a motion to approve the revised draft report, as amended and eventually finalized by Member Bornstein. Member Vura-Weis seconded the motion. Member Range noted that the use of model ordinances and regulations, instead of CEQA Guidelines, would be consistent with the approach of the City and County of San Francisco. The motion was unanimously approved without objection.

Chairperson Hayes thanked the report drafting committee and suggested revisiting the topic of recommending a CEQA Guidelines amendment during discussions on the upcoming presentations.

Member Lucks requested that staff provide the Council with more information on the tools at the disposal of the Air District and the Council, whether regarding CEQA or otherwise.

3. Report on the Annual Air & Waste Management Association (AWMA) Meeting, June 19, 2012 – June 22, 2012

Members Altshuler, Holtzclaw, Brazil and Bornstein and Chairperson Hayes reported on their experiences attending the AWMA annual conference.

OTHER BUSINESS

4. Council Member Comments/Other Business

Member Bornstein asked for staff feedback and updates. Ms. Roggenkamp noted her late arrival to the meeting being the result of her attending a joint meeting of various regional agencies at the new Metropolitan Transportation Commission building that has a project move-in date of early 2014. Member Altshuler asked what will happen to the name of the Air District office building. Ms. Roggenkamp said the building will be sold. Member Altshuler asked if the name will be transferred. Ms. Roggenkamp said it will not because of the joint tenancy of the building but the fate of the building name is a topic for consideration.

Chairperson Hayes, on behalf of the Council, recognized outgoing Member Bedsworth. Member Bedsworth addressed the Council. Ms. Roggenkamp, on behalf of staff, thanked Member Bedsworth for her years of service.

5. Time and Place of Next Meeting: Wednesday, September 12, 2012, Bay Area Air Quality Management District Office, 939 Ellis Street, San Francisco, CA 94109 at 9:00 a.m.

6. Adjournment: The meeting adjourned at 11:55 a.m.

Sean Gallagher
Clerk of the Boards

AGENDA: 1

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

DRAFT MINUTES

Advisory Council Regular Meeting
9:00 a.m., Wednesday, September 12, 2012

CALL TO ORDER – ROLL CALL

Chairperson Stan Hayes called the meeting to order at 9:04 a.m.

Present: Chairperson Stan Hayes; Vice-Chairperson Robert Bornstein, Ph.D.; Secretary Sam Altshuler, P.E.; and Council Members Jennifer Bard, Benjamin Bolles, Jeffrey Bramlett, M.S., C.S.P., Harold Brazil, Jonathan Cherry, A.I.A., LEED A.P., Caryl Hart, J.D., Ph.D., John Holtzclaw, Ph.D., Kraig Kurucz, Gary Lucks, J.D., C.P.E.A., Liza Lutzker, M.P.H., Kathryn Lyddan, J.D., Estes Al Phillips, Jessica Range, LEED A.P., and Murray Wood.

Absent: Council Members Rick Marshall, P.E., P.L.S., Jane Martin, Dr.P.H. and Dorothy Vura-Weis, M.D., M.P.H.

Also Present: None.

OPENING COMMENTS

Chairperson Hayes welcomed Council Member Caryl Hart (*Regional Park District*). Member Hart took the oath of office and made introductory remarks.

NOTED PRESENT: Member Altshuler was noted present at 9:06 a.m.

Chairperson Hayes welcomed Council Member Rick Marshall in absentia.

RECOGNITION

1. Recognition of Outgoing Advisory Council Member

Chairperson Hayes, on behalf of the Council, recognized outgoing Council Member Louise Bedsworth and presented a token of appreciation for her service. Dr. Bedsworth addressed the Council.

PUBLIC COMMENT

None.

CONSENT CALENDAR

2. Approval of Minutes of the July 11, 2012, Advisory Council Regular Meeting

Chairperson Hayes suggested a non-substantive revision to soften the language of the minutes of July 11, 2012. Members Bornstein and Lutzker each suggested alternate language. Member Altshuler said a revision may be in order.

Council Action:

Chair Hayes made a motion to table the minutes of July 11, 2012, for further review by the Council; Member Bolles seconded; and the motion was unanimously approved without objection.

PRESENTATION: ULTRAFINE PARTICLES

3. Ultrafine Particles: Exposure Reduction

A. Exposure to Ultrafine Particles On and Near Roadways
Yifang Zhu, Ph.D.
Assistant Professor
Environmental Health Sciences Department
University of California, Los Angeles School of Public Health

Jean Roggenkamp, Deputy Air Pollution Control Officer, introduced Yifang Zhu, Ph.D., Assistant Professor, Environmental Health Sciences Department, University of California, Los Angeles School of Public Health, and provided a brief description of her background.

NOTED PRESENT: Member Kurucz was noted present at 9:22 a.m.

Dr. Zhu gave a presentation entitled, "Exposure to Ultrafine Particles On and Near Roadways" (a copy of which is available on the website of the Bay Area Air Quality Management District at http://www.baaqmd.gov).

Council Comments:

Member Lutzker asked whether the term "the fan" is relative to the fan or air conditioning. Dr. Zhu responded that both were tested separately but the contribution of air conditioning was insignificant enough to complicate drawing any unequivocal conclusions about impact.

Member Bornstein recalled that a past speaker advised against isolating one's self and activating the air conditioner, noted that today's presentation seemed contradictory, and asked if he may have misinterpreted the presentation. Member Bolles said he believed the information in the two presentations to be complementary. Dr. Zhu said that greater protection is achieved by turning

off the air intake and that using the recirculation feature is similar, but that rolling up the windows and deactivating the fan is usually a last resort due to the discomfort resulting from carbon dioxide build up inside the vehicle and concluded that the best options are using the recirculation feature or installing a high quality cabin filter.

Member Altshuler said past presentations indicated that ultrafine particles (UFP) fall off quicker, through dispersion or coagulation, than other gases as they travel further from a source, but noted that slide 8, Near Roadways, does not show a distinct difference between particulate matter (PM) and black carbon. Dr. Zhu said aerosol science is a factor and that upwind air must be removed from an equation to accurately compare the rates of decay of particles and gasses.

Member Altshuler noted, regarding slide 4, Particle Regional Deposition for Light Exercise, the deposition of PM in the lungs and asked if it is theory based on air flow predictions or measurements. Dr. Zhu responded that the curves were pulled from modeling work.

Chairperson Hayes noted, regarding slide 8, Near Roadways, the sharp increases in particle mass and number on or near freeways and asked if this is primarily UFP. Dr. Zhu said it is mostly PM. Chairperson Hayes asked if on and near roadway exposures is, or should be, predominantly what UFP exposure studies focus on. Dr. Zhu said yes, however UFP generally have secondary aerosol formations that should be kept in mind.

Member Hart noted the lack of roadside vegetation as a component of the presentation and asked if any study has been conducted regarding its effect on UFP. Dr. Zhu responded that she knows of studies by others regarding dispersion modeling and so far the results seem to indicate that roadside vegetation serves to elevate the plume where it then decays. Dr. Zhu likened the effect to that seen in tunnels, which contain the emissions to a certain extent. Member Hart said she is most interested in the deposition factor and types of vegetation. Dr. Zhu noted that vegetation is not emission free and can result in particle formations through the emission of volatile particles, a complication that shows there is a great deal of work to be done in the area.

Member Bard asked Dr. Zhu to elaborate on her earlier statement that asthmatics tend to retain more particles due to reduced lung function. Dr. Zhu said the study showed a higher deposition level among asthmatics than in healthy human subjects. Member Bard asked, regarding slides 14 through 16, In-Cabin on Roadway, if the 2005 PT Cruiser afforded a higher level of protection from the other vehicles because of special equipment or by virtue of its age. Dr. Zhu said it is because it is a newer vehicle.

Member Holtzclaw noted that the Los Angeles area enjoys offshore air in the night and onshore air in the day, a system that results in a higher level of background concentrations than that seen in the Bay Area, whereas in San Francisco the wind is always offshore and enjoys a lower background level as a result. Dr. Holtzclaw asked if there are any studies on concentrations found on sidewalks and in bike lanes. Dr. Zhu said a project is underway which looks at street-users' exposure to UFP, namely reductions brought about by mixed-use streets. Member Holtzclaw asked about preliminary conclusions. Dr. Zhu responded that motor vehicle operators experience lower exposure and others have increased exposure, highlighting the environmental justice component of this field of study. Member Holtzclaw asked if the complete streets model has an effect. Dr. Zhu said the complete streets model has yet to be released. Member Holtzclaw suggested paying non-drivers for filtering the air for the region.

Member Phillips recalled that past presenters have explained the complications involved in the accurate measurement of UFP, suggested there is no direct correlation between higher PM count and UFP, and asked for comments on either aspect. Dr. Zhu responded that there generally is a direct correlation between PM and UFP counts but that it is a very dynamic process. Member Phillips said the data suggested the correlation is not constant. Dr. Zhu asked if this was based on mass concentration. Chairperson Hayes responded yes. Dr. Zhu said this is absolutely right and noted slide 3, Atmospheric Aerosols: Particulate Matter Size Distribution, showing the relationship between particle mass and count.

Member Altshuler noted, regarding slide 8, Near Roadways, that the study is dated 2002 and that a great deal has happened in the diesel world since then and asked if there is any new data. Dr. Zhu said another paper is coming out this month based on a study last year, which shows a general improvement through diesel technology, sulfur fuel contents, overall passenger vehicle improvements, and various state-funded programs to incentivize retirement of clunkers, showing overall that air quality policies seem to be doing a great job.

Public Comments: None.

B. Policy Strategies to Reduce Health Effects from Particulates
   Rajiv Bhatia, M.D., M.P.H.
   Director of Occupational and Environmental Health
   San Francisco Department of Public Health
   Assistant Clinical Professor
   University of California, San Francisco

Ms. Roggenkamp introduced Dr. Bhatia and provided a brief description of his background.

Dr. Bhatia gave a presentation entitled, "Policy Strategies to Reduce Health Impacts from Urban Particulate Pollution" (a copy of which is available on the website of the Bay Area Air Quality Management District at http://www.baaqmd.gov), with supplemental comments from and discussion with the Council as follows:

Dr. Bhatia noted at the outset that he is not an expert in UFP but instead brings a perspective that is relevant to the Council's regulatory focus and made introductory comments relative to the same.

Dr. Bhatia added, regarding slide 5, Estimated Cumulative Fine Particulate Matter ($PM_{2.5}$) Concentration, that he suspects there are not any or many residential lots in exceedence of the state standard.

Dr. Bhatia noted, regarding slide 6, Pre-mature Mortality Attributable to Cumulative $PM_{2.5}$ in San Francisco, that a noticeable jump in health effects is found as low as 8 ug/m^3.

Dr. Bhatia said, regarding slide 8, Local $PM_{2.5}$ Risk Reduction Strategies, local solutions that are deemed effective by the Air District should not be shared as best practices but instead required by regulation and San Francisco is the only U.S. city regulating enhanced ventilation systems for new residences in areas with high fine particulate levels or high cancer risks.

Dr. Bhatia noted, regarding slide 11, Thoughts for Regional Air Pollution Policy, that traffic corridors were passed over legislatively when they were not designated as emission sources similar to large refineries and that freeway management practices seem to counterintuitively result in expanded traffic corridors as the solution to air quality issues, as evidenced by recent developments regarding Interstate 710.

Dr. Bhatia said, regarding slide 12, Speed and Flow Controls Reduce Roadway Particulate Emissions, the Netherlands is a great example of a region that has urban areas and freeways intersecting and who effectively implemented lowered/variable speed limits with photo enforcement as an air quality regulatory strategy that resulted in reductions in nitrogen dioxide and $PM_{2.5}$ by as much as 30%, as well as significant amounts of greenhouse gases, and noted a staff proposal by the Metropolitan Transportation Commission (MTC) to lower the speed limit on Bay Area freeways to 55 mph as a good one that unfortunately lacked support.

Council Comments:

Member Altshuler said the Council does not discuss noise pollution and asked how closely linked it is to air pollution. Dr. Bhatia responded that in urban areas like San Francisco, traffic is 90% of the variation in noise and most of the variation in air quality from area to area and noted there is a difference in the dispersion of the two forms of pollution which creates additional variation.

Member Bornstein said anyone who believes highway expansion is a solution to congestion is behind the times, noted that dense placement of tall buildings resulted in a loss of natural ventilation in Hong Kong and Tel Aviv, and asked if anyone in the permitting department is looking at this phenomenon relative to air quality management. Dr. Bhatia said the issue was raised in reference to the Planning Department's Eastern Neighborhoods Plan along with a suggestion that it will result in increased pollution levels but that it was not studied or addressed. Dr Bhatia suggested smart growth is not necessarily smart, noting that greenfield development was considered healthy in the 1950s, as smart growth is now pursuing a path of infill development with a narrow and limited set of objectives that will create unintended externalities and continue to fall short because of a lack of the holistic vision required to find real and lasting solutions.

Member Holtzclaw asked Dr. Bhatia about the effect on intake positioning for taller buildings. Dr. Bhatia responded that although the San Francisco model is a street level one, staff implemented a policy of positioning intakes at the point of the lowest air pollution levels possible. Member Holtzclaw clarified that Member Bornstein's statement and inquiry were meant to say that the buildings themselves are serving to create a barrier to the natural dispersion of air. Member Bornstein responded yes and while there are undoubtedly environmental efficiencies of scale in the construction of such large buildings, they collectively shape the weather patterns in their immediate vicinity. Dr. Bhatia noted studies by Professor Jonathan Levy which show an increase in ground level pollutants of approximately 30% in New York City because of the street canyon effect.

Member Brazil thanked Dr. Bhatia for his support of MTC's 55mph proposal and asked, regarding slide 6, Pre-mature Mortality Attributable to Cumulative $PM_{2.5}$ in San Francisco, what

would be required to generate a similar set of data on a regional scale. Dr. Bhatia said that slide 5, Estimated Cumulative $PM_{2.5}$ Concentration, was created using Air District data and computers and suggested the Air District could create a similar map for the entire Bay Area, if they have not done so already. Dr. Bhatia said the real work is identifying and checking all of the sources in the inventory.

Public Comments: None.

PANEL DISCUSSION

4. Ultrafine Particles: Exposure Reduction

Chairperson Hayes provided background on the goals and past work of the Council as context for the panel discussion.

Member Lutzker noted that San Francisco is unique in many ways and asked how translatable the work by Dr. Bhatia is to other regions. Dr. Bhatia responded that innovation happens in many places and it is the job of regional or state agencies to absorb and generalize innovation that is deemed effective; said the job of a regional air district job seems to be assessing levels of air quality throughout its jurisdiction; suggested the work is not necessary, efficient and possible for all local jurisdictions but likely is for regional and state agencies; and recalled that San Francisco worked with its partners to collect data and shared his belief that regional and state agency resources are huge, if not targeted, and certainly adequate to create a health impact model for the entire state that accounts for vulnerability.

Member Lutzker asked staff how the Air District might enact variable speed limit traffic corridors. Ms. Roggenkamp said the Air District has regulatory authority over what are called stationary sources of air pollution; the current regulatory structure dictates that the state regulates vehicles and fuels but it seems clear that is not an adequate solution to the problem; and there has been some discussion over the years of freeways as indirect sources that attract traffic and therefore create emissions, but noted that a freeway with no vehicles has no emissions. Member Lutzker said an inactive factory does not have emissions either and asked where the authority lies to redefine traffic corridors as a stationary source subject to Air District regulations. Ms. Roggenkamp said it has been done indirectly through tools like the CEQA Guidelines and general advice to cities and counties. Chairperson Hayes said the structure of air pollution laws does not lend itself very easily to this approach, as the Air District is generally charged with meeting federal or state ambient air quality standards, both of which are attained in the models presented today, and that today's discussion is focused instead on incremental improvements to public health. Dr. Bhatia noted that this model was done in one of the cleaner air cities in the U.S. and very different results have been and would be generated elsewhere. Eric Stevenson, Director of Technical Services, said that it appears circumstances are moving in the suggested direction as the U.S. Environmental Protection Agency (EPA) is now requiring near-roadway monitoring that will result in the identification of isolated non-attainment areas within the larger region. Member Lucks said that some Air Districts are focused on indirect air quality and payment of impact fees for major sources that will attract a great deal of traffic and recalled that the appellant courts upheld this strategy.

Member Cherry asked about the relevancy of indoor sources of UFP, whether the data exists, and if a different set of questions, policies and strategies apply. Dr. Zhu responded that indoor UFP is very important in light of the average person spending 80% of their time indoors and indoor UFP falls in two categories, emissions from outdoor sources that infiltrated and from indoor sources; UFP are all very different depending on the source so the current state of science makes it difficult to say which have greater risks or how best to mitigate them; the question of how to regulate them is a complex issue coupled with the difficulties inherent with regulating cooking habits or the purchase and use of computer printers; and said there is clearly a lot to do in the future. Dr. Bhatia said there is evidence that both indoor and outdoor air quality are independently associated with health effects; one study suggests that further studies of the dynamics of outdoor/indoor air quality is important; improvements to ventilation standards improve health and wellbeing; that building design is essential and the inclusion of some requirements for new buildings into retrofit programs would be beneficial; and the level of regulations around fresh air ventilation is increasing in the building code in San Francisco.

Chairperson Hayes conducted a time check.

Member Bard said the EPA is looking at revising downward the standard for $PM_{2.5}$ and California is looking at a low carbon fuel standard despite the huge push back to weaken the standard, and asked if and how the impact maps affected support during the planning process. Dr. Bhatia said their single biggest contribution was to provide spatially relevant air pollution data because people do not think of their air quality in terms of regions; he believed it was very well received by planning staff; that while the Air District may not be able to install variable speed corridors on Bay Area freeways tomorrow, it can place monitors next to them so as to inform the public despite the lack of authority to regulate them. Member Range said Dr. Bhatia's information was extremely useful to planning staff, in that there is a clear sense of situation and process, and asked Dr. Bhatia's initial thoughts about removing freeways. Dr. Bhatia suggested it will require an earthquake. Member Range said that a topic that has been absent from the discussion for the last couple of years is the viability and effect of removing portions of U.S. Route 101 and Interstate 280. Dr. Bhatia said that an informed response would require political prognosticating but that we can be reasonably sure that as more people with more means move into those areas and become a force for change, there may be opportunities to remove some of these freeway appendages, however the elimination of U.S. Route 101 is unlikely under the current transportation model and that widening freeways as a solution seems completely illogical.

Chairperson Hayes said he is struggling with knowing the health significance of the data that clearly indicates high levels of UFP persist near high traffic roadways and asked what "high" means exactly in terms of being a health concern or something that otherwise needs to be urgently addressed. Dr. Zhu said it is a difficult question that she does not have a clear answer to as the work related to UFP, particularly in regards to epidemiology, is quite limited but health studies focusing on near-freeway impacts have a spatial cut off of significant health impacts at 100 to 150 meters from the source. Chairperson Hayes asked if UFPs are primarily a near-roadway issue. Dr. Zhu said for primary UFP, yes, but for secondary UFP it could be a regional issue as the toxicities of particles vary widely and are found in regions not generally considered to be highly impacted by major roadway emissions.

Member Bolles said the issue of elevated versus surface air quality has arisen in his own professional past and asked if this is something the speakers have encountered. Dr. Zhu

responded absolutely and has measured pollutants at different heights at fixed down-wind locations from Interstate 405, where you generally see the pollutants rise gradually and then decrease gradually, creating a system where there the highest level of pollutants is above street level. Member Bolles noted the citing of expensive housing along Interstate at the 80 Bay Bridge in San Francisco and inquired what the pollution level and corresponding filtration systems look like. Dr. Bhatia said it depends on how the filtration system has been designed. Member Bolles asked if the higher risks for these buildings is at street level or the upper floors. Dr. Bhatia said some buildings are several hundred feet tall and speculated that the risk at the freeway level is higher than that of the ground level as there is dilution with distance. Member Bornstein agreed.

Member Kurucz asked, regarding Dr. Zhu's slide 31, Filtration, why all three filters follow the same general trend in terms of efficiency in relation to particle size. Dr. Zhu responded that this has to do with aerosol dynamics. Dr. Zhu said that the filtering of smaller particles is controlled by Brownian diffusion, whereby smaller, more active particles are collected more easily by filters by virtue of their movement and the larger particles are collected through a mechanism called impaction, whereby air flow is forced to make a sharp turn through a filter and the particles are dislodged from the air flow via inertia and, thereby, captured in the filter.

Member Bornstein asked how pore size affects the minimum range of filtration performance. Dr. Zhu said pore size does not have a direct correlation with collection.

Member Kurucz noted various presentations regarding changes in particle size as they travel from the emission source and asked where the peak number of particles reside in terms of exposure for automobile passengers. Dr. Zhu said it is somewhere between 20 to 50 nm.

Chairperson Hayes conducted a time check and asked for recommendations from the speakers.

Dr. Zhu noted that her presentation was focused on mitigating exposures in microenvironments on and near roadways but from an Air District perspective the priority should be working on emissions and the important work of improving fuel economy, engine technology, public education, and urban planning to reduce vehicle miles travelled, so that while the Air District works on emissions reductions, the public is empowered to mitigate individual exposures and more fully participate in emission reduction efforts. Dr. Zhu said the question of regulating freeways versus individual tailpipes is an intriguing topic for discussion.

Dr. Bhatia said the Council's focus for two years has been on UFP and the important thing about the UFP knowledge is to not create a new separate world program focus for UFP, but to instead fold it into a bigger picture approach to air quality management; added that the Council has learned that vehicle/traffic emissions are the cause of multiple ills and UFP should be considered another argument to act on the source of the emissions; suggested that the land use/planning component has been neglected largely because of its political immunity but also because of disciplinary fragmentation and recommended thoughtful consideration of the tools available to the Air District while considering UFP as another dimension of the bigger problem.

OTHER BUSINESS

5. Council Member Comments/Other Business

Ms. Roggenkamp said that Ana Sandoval, Acting Manager, Executive Operations, is filling in for Jennifer Cooper while she is out on maternity leave; the Air District is hosting a workshop on Friday, September 14, 2012, at 9 a.m., regarding its draft PM Report, as prompted by federal air planning requirements and because PM is the biggest air quality concern in this region, and the report is based in many respects on work previously done by the Council; staff will be presenting new regulatory provisions related to cement kilns at the Board of Directors meeting on September 19, 2012; and the purchase by MTC of the new office building at 390 Main Street is complete, the Air District will purchase the portion for its use with a tentative move date in early 2014, the independent audit is complete, and the building tenants will be MTC and the Air District, perhaps the Association of Bay Area Governments, and maybe later the Bay Conservation and Development Commission, provided they can obtain a waiver of the requirement that all State agencies be housed in State buildings.

Member Lucks asked for an update on recent changes to the California Environmental Quality Act (CEQA) Guidelines. Ms. Roggenkamp asked if Member Lucks is referring to changes or the lawsuit. Member Lucks said the lawsuit. Ms. Roggenkamp said the Air District is appealing the decision but is unable to provide more detail on pending litigation.

Member Wood asked, regarding Dr. Bhatia's slide 4, Limits of Regional Air Pollutant Monitoring, what plans the Air District has for filling in the somewhat sparse monitoring system currently in place. Mr. Stevenson said the important thing to recognize is the network is set up to provide information on ambient air quality standards, and in that regard the Air District meets all requirements, but the Air District is installing equipment not required for monitoring ambient air quality standards by developing additional near roadway and general aviation airport sites. Member Wood asked if there is a long-term budget. Mr. Stevenson said there is a 5-year plan, not a budget, because much of the monitoring budget is tied to EPA funds that are unpredictable.

Ms. Roggenkamp said that Dr. Bhatia made a sweeping statement about the Air District monitoring network not supplying sufficient data for good policy and this was said in the context of neighborhood work. Ms. Roggenkamp said that while this is somewhat true in terms of some neighborhoods, the Air District network is very good overall and helps the Air District to make good policy towards reaching ambient air quality standards throughout the region, as evidenced by the tremendous progress that has been made. Ms. Roggenkamp added that there is a great deal of work remaining at the neighborhood level and the Air District is committed to doing that work despite the lack of state and federal requirements. Chairperson Hayes agreed there has been amazing progress and the cost of monitoring is such that there is never enough money to attain the ideal. Member Bornstein noted the network is generally sparsest where regional problems do not exist.

Chairperson Hayes called for volunteers for the report drafting committee. Chairperson Hayes and Members Holtzclaw, Bard and Altshuler volunteered, with Member Holtzclaw as lead author. Member Bornstein volunteered to perform a review of the proposed final report.

Mr. Stevenson noted the need for the report drafting committee to take clear and meaningful notes during the editing process so they may faithfully make any revisions discussed in meetings. Member Altshuler said that receiving the minutes a week or two after the meeting would be helpful. Mr. Stevenson said staff will make every effort to get the minutes out as quickly as possible.

Chairperson Hayes directed the Council to submit all comments to Mr. Stevenson by Monday, September 17, 2012, who will route them to the report drafting committee.

Member Bramlett said it would be helpful for Council members to receive copies of presentation requests that go to speakers in advance of meetings. Mr. Stevenson said that can be provided to the extent it is known by staff. Member Bramlett said staff is not expected to control the presentations, as that is actually the Council's job, but having this component would be helpful in accomplishing that task. Mr. Stevenson said staff will continue to prepare and issue the flier and forward copies of staff letters to speakers. Member Bramlett commended the flier and noted its effectiveness. Member Bornstein also commended the flier but suggested the Council provide names to staff who can then distribute the fliers in the future.

Member Holtzclaw and Chairperson Hayes discussed how the request-to-speak system works.

Member Holtzclaw recalled the discussion about state, regional and city authorities, noted the difficulty of granting more power to government in the current political climate, and speculated about the development of software applications that build understanding based on the sharing of air quality data, much like the weather, and asked how the Air District might get software application developers interested. Chairperson Hayes said the South Coast Air Quality Management District has a software application along those lines. Mr. Stevenson said the Air District is currently working on developing similar resources.

Member Bornstein suggested to Member Altshuler possible revisions to the minutes of July 11, 2012.

Member Altshuler said the Health Effects Institute is doing a complete health assessment of UFP and it is due out in 2013. Chairperson Hayes asked staff to track this matter and provide an update to the Council.

6. **Time and Place of Next Meeting:** Wednesday, October 10, 2012, Bay Area Air Quality Management District Office, 939 Ellis Street, San Francisco, CA 94109 at 9:00 a.m.

7. **Adjournment:** The meeting adjourned at 12:21 p.m.

Sean Gallagher
Clerk of the Boards

AGENDA: 2

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Hayes and Members
of the Advisory Council

From: Jack P. Broadbent
Executive Officer/APCO

Date: October 1, 2012

Re: Discussion of Draft Report on the Advisory Council's September 12, 2012, Meeting on Ultrafine Particles: Exposure Assessment

The attached draft report on the September 12, 2012, Advisory Council Meeting on Ultrafine Particles: Exposure Reduction was prepared by Advisory Council Chairperson Hayes and Members Sam Altshuler, Jennifer Bard and John Holtzclaw. The draft report will be discussed by the Advisory Council at its October 10, 2012, meeting.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Sean Gallagher
Reviewed by: Ana Sandoval

Attachment

AGENDA: 2A

DRAFT REPORT ON THE SEPTEMBER 12, 2012 ADVISORY COUNCIL MEETING ON ULTRAFINE PARTICLES: EXPOSURE REDUCTION

SUMMARY

The following presentations were made at the September 12, 2012 Advisory Council meeting on Ultrafine Particles: Exposure Reduction:

1. ***Exposure to Ultrafine Particles On and Near Roadways*** by Yifang Zhu, Ph.D. Professor Zhu is currently an Assistant Professor at the University of California, Los Angeles in the Environmental Health Sciences Department in the School of Public Health. Prior to that, she worked as an Assistant Professor in the Environmental Engineering Department at Texas A&M-Kingsville. Her research focuses primarily in the field of environmental exposure assessment and aerosol science and technology. Specifically, she is interested in determining the data necessary to fill the knowledge gap in quantitative exposure/risk assessments on vehicular emitted ultrafine particles that have shown higher toxicity than larger particles on a unit mass basis. Her current research focuses on identifying key factors that affect human exposure to ultrafine particles on and near roadways by measuring and modeling their emissions, transport, and transformation in the atmosphere as well as into the in-cabin and indoor environments. These research efforts are supported by two prestigious national awards, the National Science Foundation Faculty Early Career Development (CAREER) Award and the Walter Rosenblith New Investigator Award from the Health Effects Institute.

2. ***Policy Strategies to Reduce Health Effects from Particulates*** by Rajiv Bhatia, MD, MPH. Dr. Bhatia is the Director of Occupational and Environmental Health for the San Francisco Department of Public Health and an Assistant Clinical Professor of Medicine at the University of California San Francisco. He has been responsible for environmental health law and policy in San Francisco since 1998 and has broadened the scope of local environmental health to include issues of labor rights, working conditions, housing, land use, transportation, injury prevention, and food security. He has pioneered the practice of health impact assessment (HIA) in the US, institutionalizing a HIA unit in San Francisco government, teaching the first US graduate course on HIA at the University of California at Berkeley, and co-founding Human Impact Partners, a non-profit organization working nationally to build the field. He is a founding member of the Health and Social Justice Team for the National Association of County and City Health Officials and the co-editor of *Tackling Health Inequities through Public Health Practice: Theory to Action*. Dr. Bhatia earned a MD from Stanford University in 1989.

KEY POINTS

Yifang Zhu, Ph.D. - "Exposure to Ultrafine Particles on and Near Roadways"

- Recent studies have examined near-freeway traffic-related air pollution health effects, including cardiac and pulmonary health risks, adverse effects on children's lung development, decreased lung function in adult asthmatics, and autism incidence.

- Most ultrafine particle (UFP) deposition occurs in the deep-lung alveolar (gas-blood interface) region. Deposited UFP can result in alveolar inflammation and, because of their mobility, UFP can migrate from the lung and nasal passages to the heart, brain, and other areas of the body.

- Unlike PM10 and PM2.5, ultrafine particles (UFPs) have high particle numbers, but low mass.

- Vehicle emissions usually constitute the most significant source of UFPs in an urban environment.

- UFP particle numbers measured at two monitoring locations in LA were highest during peak commute periods (6-9am, 6-9pm), consistent with vehicle emissions as a major contributor. Additionally, particle numbers in the air over an LA freeway were nearly seven times higher than background, while particle mass increased only about 10 percent.

- UFP numbers decayed exponentially with distance downwind of two LA freeways, dropping by nearly an order of magnitude within 100 meters of the roadway; this is a faster reduction than what occurs with gaseous emissions. Elevated UFP particle numbers downwind of a freeway in LA persisted during the night at a higher level than upwind up to a mile, a greater distance than during the day. The diurnal wind flow reversals in valleys and presence of large bodies of water can also increase UFP on both sides of the roadway.

- UFP numbers were measured on a freeway (I-710) heavily travelled by heavy-duty diesel trucks than on another freeway (I-405) with less such traffic, indicating diesel trucks as a significant contributor to UFP. The key is that UFP is measured along both freeways, not just those with diesels. Thus gasoline engines contribute to UFP

- Significant numbers of UFP can penetrate indoors into residences near freeways. This can be a significant contributor to UFP exposures for residents, given that more than 90% (often more than 90%) of most people's time is spent indoors. Particles that are greater in size than 50 nanometers (nm) penetrate indoors more easily than those that are less than 50 nm.

- In-vehicle cab recirculation using a filter reduced UFP exposure measured in three different makes/models of vehicles to between 5% and 40% of UFP levels in outside air. The degree of UFP reduction depends on age and model/make of vehicle and such factors as cabin tightness, size, materials, and type of filter, which can influence outdoor air penetration, deposition efficiency, and degree of filtration. However, with reduced air penetration, carbon dioxide (CO2) can build up inside the car significantly, creating a secondary concern.

- Using a mathematical model, in-cabin ventilation measures, including air recirculation (RC) and a fan, were calculated to affect UFP exposure while in a vehicle as follows:

    - With the fan and RC off, in-cabin UFP levels were calculated to be about 40% of outdoor on-roadway levels.
    - With the fan on and RC off, in-cabin UFP levels were about 20% of outdoor on-roadway levels.
    - The best protection is afforded when both the fan and RC are operating, with in-cabin UFP levels less than 10% of outdoor on-roadway levels.

- In-cabin filtration has significant potential to reduce commuters' exposure to ultrafine particles while at the same time solving the CO2 build up problem. HEPA filters provide the greatest protection. Stand-alone air purifiers can significantly reduce PM2.5 and UFP levels inside vehicles, including school buses.

- Recommended measures to reduce UFP exposure near roadways include:
    - Meteorology: Stay on the upwind side of major roadways or 100+ m downwind/
    - Spatial profile: Stay away from major roadways
    - Temporal profile: Avoid heavy traffic hours.

- Recommended measures to reduce UFP exposure inside vehicles include:
    - Route: Avoid heavy-duty vehicle routes
    - Driving: Avoid idling, turn off buses at transfer points
    - In-cabin ventilation: Close window and turn on recirculation
    - In-cabin filtration: Use HEPA filter/air purifier.

- 2011 data shows that UFP concentrations across freeways have decreased with low sulfur fuel, filters, removal of clunkers, and modern technology.

<u>Rajiv Bhatia, MD, MPH – "Policy Strategies to Reduce Health Impacts from Urban Particulate Pollution"</u>

- Regional monitors are not adequate for assessing localized exposure levels in close proximity to significant local sources, such as freeways and do not provide adequate data for policies directed at such exposures. Europe has been doing localized monitoring for some time. There is a priority need for neighborhood scale air pollution models.

- For a variety of reasons, infill growth has been concentrated near eastern SF freeways. San Francisco is ahead of the curve in air pollution exposure assessment. To guide policy the city has developed maps showing modeled estimated cumulative PM 2.5 concentrations along roadways. These maps have been extremely helpful in building public support for policies to mitigate emissions.

- All areas of San Francisco meet both federal and state annual PM2.5 standards. Few places in SF have PM2.5 levels higher than 10 ug/m3, which is lower than the state annual standard of 12 ug/m3 and the federal annual standard of 15 ug/m3. Background levels in SF are approximately 8 ug/m3. SFDPH has estimated there are 103 annual premature deaths due to exposures in areas with annual PM2.5 levels above background. This illustrates the value of continued PM2.5 reductions, even when clean air standards are met.

- To reduce exposures to urban air pollution in infill areas, SF developed Health Code Article 38 which requires mitigation in areas with high air pollution to remove 80 percent of outdoor PM2.5 via building design or engineered ventilation.

- A number of thoughts for regional air pollution policy were listed, including regulation of traffic corridors as emissions sources (e.g., limits on highway capacity expansion, innovative solutions such as urban freeway speed control) and the identification and prevention of local air pollution use conflicts (e.g., commercial exhausts).

- Local strategies to reduce PM2.5 include emission reductions (e.g., limiting growth of traffic density through land use, pricing, parking control, impact fees, improved transit, bicycle and pedestrian environments) and exposure management (e.g., enhanced ventilation systems for new residences in areas with high fine particulate levels or cancer risks; improving ventilation in existing residential dwellings).

- Local best practices (e.g., ventilation upgrades via weatherization programs) could be regionalized.

- Because more mid to upper income residents are moving into infill areas with higher levels of PM, air pollution exposure disparity among income levels is decreasing.

- Both noise and pollution emission levels increase with traffic. Noise control ordinances can be a means for addressing indoor air quality through the design of buildings.

EMERGING ISSUES

The Advisory Council has identified the following emerging issues:

- Proximity to traffic and vehicle emissions are keys to UFP exposure. There is a need to better understand the relative effectiveness of individual strategies to reduce UFP and other sources of air pollution, as well as the interaction of various mitigation strategies designed to reduce air pollution exposures (e.g., in vehicle cabin, in building, and source control).

- Reducing UFP exposure near roadways depends on varying conditions, including staying upwind of major roadways. It will be important to craft effective public education messages that help the public understand how to reduce UFP exposure, especially in neighborhoods closest to freeways and to age or occupation groups who are expected to have higher UFP exposures (e.g., cyclists, pedestrians and on- or near-roadway occupations such as toll takers). Messaging should incorporate social vulnerability and cumulative impacts.

- There is a need to determine siting criteria that better take into account local conditions and other factors to most effectively reduce UFP exposure.

- There is a need to develop measures to reduce UFP while driving. This is expected to include enhanced vehicle cabin recirculation and filtration. There is a wide range of filter efficiencies for in-cabin filters, and none approach HEPA level efficiencies at the particle size distribution experienced by the drivers.

- San Francisco is ahead of the curve in establishing building code standards to minimize air pollution exposures (e.g., enhanced ventilation systems for new residences with higher fine particulate levels or cancer risks). There are 100 cities within the remaining 8 counties within the BAAQMD jurisdiction that do not have any such mechanisms in place. State/regional agencies could develop model policies for UFP exposure and disseminate them to local governments. Energy efficiency programs to weatherize existing housing stock could help ensure that ventilation systems are also improved as air penetration is tightened.

- Noise control laws can be a model for reducing indoor air quality exposures with new construction.

- The is a need to better understand the range of measures available to reduce UFP and PM2.5 and their relative costs and benefits (e.g., reducing traffic speed to 50 MPH may have the greatest immediate impact on reducing greenhouse gases, air pollution, as well as co benefits of noise, vehicles injuries and fatalities; and it should also reduce UFP).

RECOMMENDATIONS

The Advisory Council recommends that the District:

- Continue efforts to integrate UFP into its efforts to reduce PM exposure.

- Continue to follow the development of, and incorporate into the District's existing multi-pollutant approach to air quality planning, emerging methods for analyzing UFP exposures, health risks, and mitigation. Include in public education messaging to support existing strategies to reduce PM2.5.

- Integrate UFP monitoring with required NO2 roadside monitoring. Consider supplementing regional monitoring system with localized monitors to gain a better understanding of UFP exposures in varying traffic and neighborhood environments.

- Continue efforts to model UFP and develop a UFP emission inventory.

- Work with other agencies to encourage development of standards and incorporation of measures to reduce UFP exposures in vehicles (e.g., in-cabin vehicle filtration and recirculation systems). Educate the public regarding the use of such measures.

- Provide guidance to lead land use agencies (e.g., cities and counties) on means to evaluate the potential impacts of the infiltration of outdoor air into indoor spaces. The District should consider working with other regional agencies and cities and counties to encourage the adoption of a building code standard modeled after the San Francisco standard.

- Present material to the Advisory Council on the state of the science of cumulative impacts analyses.

- Consider developing, or offering a prize for developing, a District smart-phone or iPad app that can improve public understanding of the dangers of air pollution and provide information about current air quality, Spare-the-Air alerts, personal actions that could be taken, news and events, alternative fueling station locations, calculation of carbon footprints, smoking vehicle complaints, and other useful information.