BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

ADVISORY COUNCIL MEETING

WEDNESDAY
APRIL 11, 2012
9:00 – 11:00 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

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 March 14, 2012 Advisory Council meeting

DISCUSSION

2. Discussion of revised draft report on the Advisory Council's February 8, 2012 meeting on Ultrafine Particles: Ambient Monitoring and Field Studies

   The Advisory Council will discuss the revised draft report on the February 8, 2012 meeting with Air District staff and finalize the recommendations.

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

   9:00 a.m., Wednesday, May 9, 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) 771-6000

EXECUTIVE OFFICE:
MONTHLY CALENDAR OF DISTRICT MEETINGS

APRIL 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Advisory Council Regular Meeting *(Meets 2nd Wednesday each Month)*	Wednesday	11	9:00 a.m.	Board Room
Board of Directors Executive Committee *(Meets 3rd Monday of each Month)* **- CANCELLED**	Monday	16	9:30 a.m.	4th Floor Conf. Room
Board of Directors Climate Protection Committee *(At the Call of the Chair)*	Monday	16	10:30 a.m.	4th Floor Conf. Room
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	Wednesday	18	9:45 a.m.	Board Room
Board of Directors Budget & Finance Committee *(Meets the 4th Wednesday Each Month)*	Wednesday	25	9:30 a.m.	4th Floor Conf. Room
Board of Directors Mobile Source Committee *(Meets 4th Thursday each Month)*	Thursday	26	9:30 a.m.	4th Floor Conf. Room

MAY 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	Wednesday	2	9:45 a.m.	Board Room
Advisory Council Regular Meeting *(Meets 2nd Wednesday each Month)*	Wednesday	9	9:00 a.m.	Board Room
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	Wednesday	16	9:45 a.m.	Board Room
Board of Directors Executive Committee *(Meets 3rd Monday of each Month)* **- CANCELLED**	Monday	21	9:30 a.m.	4th Floor Conf. Room
Board of Directors Stationary Source Committee *(Meets 3rd Monday Every Other Month)*	Monday	21	10:00 a.m.	**Meeting Location:** Creekside Park Building 10455 Miller Avenue Cupertino, CA 95014 **Tour Location:** Lehigh Southwest Cement Company - Permanente Plant 24001 Stevens Creek Boulevard Cupertino, CA 95014

May 2012 Calendar Continued on Next Page

MAY 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Budget & Finance Committee *(Meets the 4th Wednesday Each Month)*	**Wednesday**	**23**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday each Month)*	**Thursday**	**24**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Public Outreach Committee *(Meets Quarterly at the Call of the Chair)*	**Thursday**	**31**	**9:30 a.m.**	**4th Floor Conf. Room**

JUNE 2012

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**6**	**9:45 a.m.**	**Board Room**
Advisory Council Regular Meeting *(Meets 2nd Wednesday each Month)*	**Wednesday**	**13**	**9:00 a.m.**	**Board Room**
Board of Directors Executive Committee *(Meets 3rd Monday of each Month* **- STAFF RECOMMENDS CANCELLING, TO BE DETERMINED BY THE CHAIR**	**Monday**	**18**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month* **- STAFF RECOMMENDS CANCELLING, TO BE DETERMINED BY THE CHAIR**	**Wednesday**	**20**	**9:45 a.m.**	**Board Room**
Board of Directors Public Outreach Committee *(Meets Quarterly at the Call of the Chair)* **- STAFF RECOMMENDS CANCELLING, TO BE DETERMINED BY THE CHAIR**	**Thursday**	**21**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Budget & Finance Committee *(Meets the 4th Wednesday Each Month)*	**Wednesday**	**27**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday each Month)*	**Thursday**	**28**	**9:30 a.m.**	**4th Floor Conf. Room**

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Stan Hayes and
Members of the Advisory Council

From: Jack P. Broadbent
Executive Officer/APCO

Date: March 26, 2012

Re: Advisory Council's Draft Meeting Minutes of March 14, 2012

RECOMMENDED ACTION:

Approve attached draft minutes of the Regular Advisory Council's meeting of March14, 2012.

DISCUSSION

Attached for your review and approval are the draft minutes of the March 14, 2012 Advisory Council meeting.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Sean Gallagher
Reviewed by: Jennifer C. Cooper

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, March 14, 2012

CALL TO ORDER – ROLL CALL

Chairperson Stan Hayes called the meeting to order at 9:12 a.m.

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

PUBLIC COMMENT PERIOD

None.

CONSENT CALENDAR

1. Approval of Minutes of February 8, 2012, Advisory Council Regular Meeting

Member Kurucz requested an amendment to the partial paragraph at the end of page 2, to read, "… the cube of the radius~~diameter~~, and measurements of mass are taken at arbitrary points along the scale…"

Member Holtzclaw made a motion to approve the minutes of February 8, 2012, as amended. Member Kurucz seconded; carried unanimously without objection.

PANEL DISCUSSION

2. Discussion of draft report on the Advisory Council's February 8, 2012 meeting

Chairperson Hayes made introductory comments regarding the speakers and report drafting process. Member Kurucz made introductory comments regarding the draft report currently under review and invited input from the Members on the sections within as follows:

Key Points – Dr. Philip M. Fine

Member Range suggested the "50%" statistic provided at #4 is internally inconsistent with Emerging Issue #1.d. Member Holtzclaw proposed the distinction to be the result of intrusion by ultrafine particulate matter (UFP) from outdoor sources versus indoor levels when indoor sources are taken into account. Member Cherry agreed with Member Range and suggested an amendment to remove the figure to note instead that indoor levels tend to be lower.

Member Altshuler noted, regarding #1, that measurement techniques are still in the research phase and that fact may be worth noting. Member Kurucz suggested the addition be held for discussion relative to the Recommendations or Emerging Issues sections, as the current language is representative of Dr. Fine's presentation.

Chairperson Hayes, regarding #2, questioned the accuracy of the statement, "The zone of influence can actually extend much beyond that…," noting that his general recollection is that UFP zones dissipate very quickly beyond 300 meters. Member Kurucz replied that Dr. Fine seemed to say 300 meters is generally true subject to fluctuations resulting from location-specific conditions.

Gary Kendall, Advisory Council Liaison, clarified that the accepted norm is that indoor air pollution levels are approximately 50% of that found outside but this is still an unknown for UFP and indoor sources contribute significantly to the total level. Chairperson Hayes noted that he was struck by the information provided by Dr. Fine relative to the Santa Monica Airport. Member Kurucz suggested the Los Angeles area climate and their typical HVAC use as possible factors in the difference. Eric Stevenson, Director of Technical Services, noted Dr. Fine's comment that the composition of the fine particulate matter ($PM_{2.5}$) and UFP near the airport was very carbonaceous and, therefore, too "sticky" to be making it through various openings in the house.

Member Bard suggested, regarding #1, the use of "Methods for accurately measuring…" in place of "Measurements for…" and, regarding #3, that the current statement doesn't move the dialogue forward and it be revised to "Filters..." in place of "The right filtration…" Member Kurucz concurred with both points but suggested that the proposal for #3 would be better placed in Recommendations because the current wording should clarify for readers that filter choice will have an effect on the outcome. Member Bolles interjected that HEPA filters are commonly used in the construction field and speculated that the implementation of something similar for an entire building would require the equivalent of a jet engine. Member Phillips noted that the use of the recirculate feature of a filter system will create a pressurized system that pulls outdoor air in through any fissures. Member Bornstein seconded Member Bard's proposal regarding #3 and suggested the addition of "…and effective" after "…expensive." Member Kurucz noted the seal

issues involved in the proper use of HEPA filtration. Member Bornstein further proposed the addition of a note regarding the importance of a proper seal. Member Kurucz replied that this would be an accurate statement but it does not accurately reflect what was said by Dr. Fine, who was speaking about schools and how teachers have control of air sources and the resulting air quality in classrooms. Member Bornstein suggested instead the use of, "...if properly installed and used" and agreed with the need for a modification of the specific percentage in #4.

Chairperson Hayes suggested, regarding #3, adding language noting the other filters as being used for $PM_{2.5}$.

Member Lucks proposed editorial changes, including the addition of meter, nanometer, particulate matter, ACES, carb and similar terms to the Glossary. Member Kurucz asked if there is a glossary for the Advisory Council generally that would be a better place for them to which Chairperson Hayes replied that they should be added to the Glossary in this report.

Key Points – Dr. Eric Fujita

Member Cherry suggested the addition of a point about microenvironments and topography. Member Kurucz agreed that they were a focus of Dr. Fujita's presentation but it is unclear whether it is a Key Point or an Emerging Issue.

Member Lucks suggested, regarding #2, the addition of "…the emissions of…" before "…the vehicle ahead."

Jean Roggenkamp, Deputy Air Pollution Control Officer, noted that the terms "UFP" and "PM" are both used in the report and shared her concern about consistency and accuracy. Member Bornstein suggested that UFP is used almost exclusively and the report seems clear. Ms. Roggenkamp responded that she was not present for the entire presentation but that Dr. Fujita seemed to jump between the terms, using them interchangeably while she was present. Mr. Stevenson interjected to clarify that Dr. Fujita discussed wood smoke in the context of $PM_{2.5}$ and Dr. Fine provided additional information regarding particle size, concluding that perhaps separating the attributions is advisable for accuracy's sake and, at the same time, accomplishing the clarification sought by Ms. Roggenkamp. Chairperson Hayes and Member Kurucz expressed their agreement with this suggestion. Member Bard urged the proper attribution of presenter statements. Member Phillips agreed with Ms. Roggenkamp's assessment regarding the lack of clarity in term usage. Member Kurucz proposed that the focus of the presentation was noting the varying particle peaks rather than a direct comparison. Mr. Kendall recalled that $PM_{2.5}$ measurements were discussed relative to roadways and camp fires, with peak particle size a topic of later discussion. Mr. Stevenson clarified that Dr. Fine was talking about conditions relative to forest fires, not wood burning generally. Member Bornstein suggested, regarding Dr. Fine's Key Point #1, the size range be provided so as to avoid confusion. Member Kurucz asked what the size set should read to which Mr. Kendall replied 100 nanometers is the maximum in the range. Member Bornstein suggested that if wood smoke appears to not be a big contributor to UFP then it should be stated as such and left at that. Member Altshuler suggested that it is as yet unknown. Member Bornstein suggested a review of the notes. Member Holtzclaw shared his recollection that the description was less conclusive than the report and Council are making it out to be and urged caution using this level of detail.

Chairperson Hayes suggested, regarding #3, the inclusion of language that relays the importance of proximity to sources. Member Bornstein noted that he will follow up with his acquaintance whom is a specialist on forest fires. Member Kurucz said that he will add a bullet point for Dr. Fine and correct the bullet point for Dr. Fujita. Member Altshuler suggested that perhaps too much is being made of camp fires and that more data through further testing is required. Member Kurucz concurred.

Emerging Issues

Member Holtzclaw relayed that it was news to him to consider camp fires as having significant health consequences and suggested noting the same. Member Bard agreed, further suggesting an addition to #1 regarding the unknowns of the health consequences of UFP from wood smoke. Member Phillips proposed that UFP was the focus of the presentations, with wood smoke as an aside, and that the Council be cautious not to allow the wood smoke issue to lead it astray.

Member Bornstein suggested, regarding #1.d. an addition to read "…between UFP source…" instead of "…between source…" and a revision the opening words to something along the lines of "A better understanding is needed…" and that the Council should omit specifics, instead noting that airports are special circumstances. Members Kurucz and Bornstein discussed how best to break the bullet point in two.

Member Holtzclaw noted that the San Francisco International Airport insulated a number of homes near the airport for noise abatement purposes and their air quality may be beneficially impacted.

Member Bard proposed, regarding #2, including outdoor grills, wood-fired pizza ovens and other cooking-related emitters at homes and businesses as items with unclear data that require further, prioritized research and the inclusion of an excerpt from the public comment by Susan Goldsborough, Executive Director, Families for Clean Air, on January 11, 2012. Member Kurucz expressed his support of Member Bard's suggestion to include cooking-related emitters and his hesitation to include comments from a non-presenter. Chairperson Hayes expressed his support of Member Kurucz's comments. Mr. Stevenson suggested including the items as an emerging issue with a general description to capture the broad universe of emissions sources, thereby satisfying both preferences. Ms. Roggenkamp pointed out that some of the items seem best characterized as statements and others as Council items of interest, suggesting that this is not problematic but is disconcerting, and further suggested an opening statement that clarifies. Chairperson Hayes agreed and suggested, in keeping with the concept that Emerging Issues is a future action list for Council assessment and not a recitation of statements, that the bullet points be revised to avoid statement phrasing.

Member Bolles noted that the expenditure of Air District resources on emissions testing technology and public information campaigns are the points where the Council's work is commonly converted into action and asked how and where these items should be placed in the report. Ms. Roggenkamp said that they can go in either Emerging Issues or Recommendations depending on the Council's approach.

Member Kurucz said he would either correct each bullet point in Emerging Issues or insert an introductory statement. Member Bornstein said that there are three statements possible, the

known, unknown and things we need to do know more about, and that if an item falls in the latter category it belongs in Emerging Issues. Chairperson Hayes and Member Bornstein discussed the nature and purpose of statements in the report. Member Bornstein suggested that Sources of UFP be advanced to #1, Measurements to #2 and Exposure become #3; that the first portion of #1.f. is misplaced and should instead be placed before #1.d.; and that the second portion of #1.f. is a Recommendation that should be a new bullet point elsewhere, the final location to be determined based on its final wording. Member Kurucz responded that #1.f. seems like the appropriate location for the information as it follows #1.d. and e., suggesting that it is premature to move it from Emerging Issues to Recommendations. Chairperson Hayes said that Member Bornstein's suggestion regarding reordering #1 seems to make logical sense but that he likes Exposure at the front end for the sake of readers. Members Bornstein and Kurucz discuss the varying writing conventions between business and academic circles. Member Kurucz asked for a show of hands and the majority of the Council agreed to leave the sections in their current order.

Member Bolles said that much of the last year left him searching for a sense of where the Council was headed in its engagement of issues until the end of the year and asked staff to provide some direction on what the District needs or where it sees the Council heading. Mr. Stevenson answered to affirm that this is an over-arching principle for the Council and that there are a number of areas where Air District resources might be applied in a beneficial way.

Member Holtzclaw mentioned the emerging issue of secondary organic aerosols, suggesting them to be UFP by a different name, and the comparisons drawn between the weekday and weekend levels in a recent third-party study, suggesting the addition of these findings as a potential emerging issue. Member Kurucz asked if secondary organic aerosols are nitrates and sulfates. Mr. Stevenson briefly explained the genesis of secondarily formed organic compounds. Chairperson Hayes responded that it is difficult to say how and when an emerging issue should enter the discussion. Member Kurucz suggested that it be vetted by Mr. Kendall for its applicability and the availability of speakers. Chairperson Hayes agreed and urged adherence to past practice. Member Phillips said, regarding Mr. Stevenson's comment, that it is not in the Council's best interest to limit the list to a narrow field at this point.

Member Bard noted the chart from Dr. Fujita regarding cooking within public buildings and suggested that the effect of these facilities on public health be added as an Emerging Issue. Member Cherry noted that they are already captured by the existing text in #1.c. to which Member Bard recommended that specific language be added. Member Kurucz suggested adding this point to Dr. Fujita's Key Points #3 and then it can be carried forward as an Emerging Issue.

Chairperson Hayes highlighted the juxtaposition of #3.a. and b. as they currently read, sharing his commendation of the Air District's decision to get in front of an issue by acquiring the necessary equipment rather than waiting for the perfect equipment, just as they are doing at the South Coast Air Quality Management District (SCAQMD). Mr. Kendall added that even if the equipment isn't perfect, as was the case with the first ozone monitors available years ago, there is important value in acquiring trend data and that despite the wording in #3.a., the equipment is quite good. Chairperson Hayes agreed and suggested an editorial revision of #3.a. or the addition of a statement that SCAQMD has purchased 10 particle counters. Member Kurucz said that the intended point was that the Council is not ready to make a final call on a network standard and asked for suggestions about how best to rectify #3.a. and b. to capture the appropriate caveats and brighten the assessment. Member Bornstein suggested adding, "The Air District has thus

purchased 4 state of the art particle counters for…" to #3.b. Mr. Stevenson agreed with this suggestion and recommended the addition of, "… to develop information about sources, trends, and so on." Chairperson Hayes noted that the Air District is engaging an emerging issue and that in order to do so effectively it must acquire the necessary equipment. Member Kurucz said that was the intent of #3. Mr. Kendall made various editorial suggestions.

Member Bornstein suggested the deletion of #3.a.iii. Member Kurucz relayed that the intent was to avoid encouraging another set of unnecessary tests and that, "…measurements tend to confirm…," may better convey the sentiment. Member Bornstein inquired whether it is appropriate to include Ambient Air Quality Standard (AAQS) in #3.a.i. Ms. Roggenkamp confirmed that AAQS refers to the concentrations present in the air, not necessarily how many or what type of people are exposed. Henry Hilken, Director of Planning, Rules & Research, noted that staff has undergone a much broader engagement of the issue than what is currently listed in #3.b. and suggested language be added to exemplify these activities. Member Bolles asked if this is where the report should recommend the Air District's resources be redirected. Chairperson Hayes suggested an addition to Recommendations regarding broader efforts by the Air District. Member Lucks proposed the inclusion of "Some… tend to…" to #3.a.iii. along with the additional statement already discussed.

Member Altshuler asked staff about the nature of the aside between by Dr. Fine and staff during the presentation. Mr. Stevenson shared his recollection that it was regarding the results of efforts by SCAQMD to enhance school filtration systems and the Air District's current efforts on the same front.

Mr. Stevenson, in regard to the prior discussion about #3.b., noted that the Air District provides feedback to manufacturers of these devices and suggested the inclusion of language that exemplifies the Air District's involvement in that process.

Member Kurucz summarized the proposed changes to Emerging Issues.

Member Bornstein suggested the addition of a phrase in #3.a.iii which calls out the tendency to assume a common trend between $PM_{2.5}$ and UFP. Member Lucks and Member Bornstein discussed the nature of their shared chemistry and coagulation issues. Member Kurucz suggested that the presenters were making a deeper point that researchers tend to take known data and modeling to build a hypothesis and then, when measuring, set out to confirm it. Member Bornstein asked Saffet Tanrikulu, Research & Modeling Manager of Planning, Rules & Research, about the accuracy of Member Kurucz's summary. Mr. Tanrikulu agreed with the statement.

Member Phillips noted that UPF and $PM_{2.5}$ do not follow the same trends. Member Kurucz asked where this comment belongs in the report.

Member Range noted that #2 is missing the various cooking sources that were discussed. Chairperson Hayes suggested amending the list so vehicles are the opening and most important item followed by ever lesser contributors. Member Bard agreed. Member Kurucz suggested engines at the front end and then "others, such as…" at the end.

Recommendations

Member Bard suggested, regarding #1, the addition of "…by distance" after "UFP." Member Kurucz suggested instead the addition of another letter bullet under #2 regarding proximity.

Member Altshuler suggested, regarding #1, the addition of "…emissions…" before "strength" to which Member Lucks proposed the substitution of "contribution" in place of "strength" and insertion of "…emissions…" before "sources."

Chairperson Hayes recommended moving #4 to #1 as an overarching statement with the addition of "The Air District should continue development of its UFP program, including air monitoring, a source emission inventory, air quality modeling, exposure assessment and health impacts, development of UFP…," to which Member Kurucz agreed.

Mr. Kendall recommended, regarding #2.c., the deletion of the portion that begins, "Note:…" as redundant in light of the aforementioned revision to #1.

Mr. Stevenson recommended, regarding #2.c., the insertion of "…and other sources…" after "wood smoke."

Ms. Roggenkamp inquired about the reason for drawing a distinction between #2.a. and c., in response to which Member Kurucz asked if #2.a. should be deleted or added to the new #2.c. Ms. Roggenkamp replied to question the distinction between "role" and "significance." Member Altshuler suggested the genesis as having to do with lube oil as a universal issue and wood smoke to be one more exclusive to the Bay Area. Member Kurucz agreed. Chairperson Hayes asked about the distinction between #1 and 2. Member Kurucz described #1 as being an opening statement regarding Recommendations generally.

Member Range questioned whether #2 is properly a key question under Recommendations or better placed as a Source under Emerging Issues. Member Kurucz proposed that it is a key question which references back to Emerging Issues, noting that #2 may be deleted in light of the #1 proposed by Chairperson Hayes and that #3 has become somewhat of a repeat of #2.a. Chairperson Hayes noted that the purpose of #2 is to flag especially important items for investigation. Member Altshuler suggested elaboration on wood smoke to include a list of sources such as wood stoves, grills and so on. Member Kurucz proposed lube oil be added as part of the short list.

Member Lucks asked, regarding #5, whether schools and assisted living facilities should also be included. Mr. Stevenson suggested the use of "sensitive populations" should the Council opt to amend #5 pursuant to Member Lucks' suggestion.

Member Cherry noted that #5 seems to be making two different points of focusing on sensitive receptors and determining what is an effective filtration method. Member Kurucz warned about making the statement too vague to which Member Lucks replied that the solution is to provide context for the statements. Chairperson Hayes agreed and noted the importance of UFP's correlation with $PM_{2.5}$ and suggested and the insertion of "…and interrelationship with $PM_{2.5}$" at the end of #5. Member Bolles noted that this is only relevant to existing buildings to which

Chairperson Hayes replied that it is more broadly relevant, noting that filtration or vegetation barrier requirements are applicable to new construction near major sources. Member Kurucz suggested instead adding a note to #2 regarding the interrelation. Chairperson Hayes agreed. Member Range noted that a somewhat related issue is whether outdoor UFP are penetrating homes at all and at what rate. Chairperson Hayes agreed and asked for recommended language. Member Range suggested a separate Recommendation, "Further monitoring and evaluation of indoor versus outdoor UFP concentrations at buildings, not necessarily emissions source proximity testing only." Member Kurucz agreed to insert this as a key question in #2.

Chairperson Hayes recommended the use of "…without waiting for…" in place of "…without regard to…" Ms. Roggenkamp suggested that the Recommendations, as they currently read, are inconsistent with the Air District's public education approach of very focused and conscious messaging; the Recommendations instead seem broad in scope, overly conclusive and heavy-handed in their delivery; and finally provided an example from the wood smoke campaign. Chairperson Hayes suggested that public outreach staff assist with tailoring the final message. Member Kurucz noted that almost every editorial comment characterized this as conclusive data that required immediate action and agreed with Chairperson Hayes. Member Altshuler proposed that the Recommendations may be a perfect first draft of the job description for a public health officer at the Air District. Ms. Roggenkamp replied that the public health officer, if and when the Air District has one, will help to inform the public relations officer but not be conducting public relations work independently.

Member Holtzclaw suggested the addition of heavy smoking to the list to which Member Lucks proposed that there is a foundation for the same. Member Kurucz responded that the point of the exercise is to develop recommendations but not necessarily in such a prescriptive fashion and perhaps including it in the list of key points would be more appropriate.

Member Bard agreed with Chairperson Hayes that public outreach staff be left to tailor the message and requested that #7 be added to the report to read, "Consider policies to reduce exposures to outdoor grilling, burning and cooking." Chairperson Hayes responded that it is unclear how to insert the language except as an item in a list of possible dangers. Member Bard replied that the current wood smoke regulations started as a voluntary recommendation, noting that the same evolution would be acceptable for this issue and again requested its addition as a Recommendation. Member Kurucz suggested that it is already captured, to the extent it is appropriate, by the current #4 going to #1. Member Bard said that the Council needs to be aware of all issues despite UFP being the prescribed topic and that it is among the Council's duties to push issues to the forefront of dialogue. Chairperson Hayes expressed his appreciation for Member Bard's comment and his agreement with Member Kurucz's sentiment that it is premature and unfounded at this time.

Member Bard made a motion to amend the report in keeping with her suggestion that Council recommend consideration of policies to reduce exposures to outdoor grilling, burning and cooking. Member Holtzclaw seconded the motion; defeated with four votes in favor and seven opposed. Member Kurucz clarified that the recommendation may be in keeping with what the Council concludes but it is currently premature.

Member Bolles asked if the notion was captured that airports are major emissions sources at first glance but represent a lesser issue when considered comparatively. Member Kurucz replied in the affirmative, noting that it is captured by different wording.

Chairperson Hayes made closing comments.

Public comments: None.

OTHER BUSINESS

3. Council Member Comments/Other Business

Member Holtzclaw noted the strengthening recommendation in the community that Caltrain be electrified, specifically that portion running between San Francisco and Sacramento, and asked if the Air District has plans regarding an analysis of or stance on the recommendation. Ms. Roggenkamp responded that staff is talking with the Metropolitan Transit Commission regarding whether any Air District grant money may be used to electrify the line but is not involved in conducting an analysis or making a recommendation.

Chairperson Hayes invited letters of interest from those members of the Council that are interested in attending the Air and Waste Management Association 2012 Annual Conference and Exhibition in June.

Ms. Roggenkamp announced the birth of Member Lutzker's baby girl.

Mr. Stevenson noted that Member Lucks will be presenting an informal legislative update here at noon today. Member Lucks made an introductory statement.

4. **Time and Place of Next Meeting:** Wednesday, April 11, 2012, Bay Area Air Quality Management District Office, 939 Ellis Street, San Francisco, CA 94109 at 9:00 a.m.

5. **Adjournment:** The meeting adjourned at 11:54 a.m.

Sean Gallagher
Clerk of the Boards

AGENDA: 2

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Stan Hayes and
Members of the Advisory Council

From: Jack P. Broadbent
Executive Officer/APCO

Date: March 26, 2012

Re: Discussion of Revised Draft Report on the Advisory Council's February 8, 2012 Meeting on Ultrafine Particulate: Ambient Monitoring and Field Studies

The attached revised draft report on the February 8, 2012 Advisory Council Meeting on Ultrafine Particulate: Ambient Monitoring and Field Studies was prepared by Advisory Council members Kraig Kurucz, Sam Altshuler, Ben Bolles and Al Phillips.

The revised draft report will be discussed by the Advisory Council at its April 11, 2012 meeting.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Gary Kendall
Reviewed by: Jean Roggenkamp

AGENDA: 2A

REVISED DRAFT REPORT ON THE FEBRUARY 8, 2012 ADVISORY COUNCIL MEETING ON ULTRAFINE PARTICLES: AMBIENT MONITORING AND FIELD STUDIES FOR DISCUSSION BY THE ADVISORY COUNCIL AT THE APRIL 11, 2012 MEETING

SUMMARY

The following presentations were made at the February 8, 2012 Advisory Council meeting on Ultrafine Particles (UFPs; see list of definitions): Ambient Monitoring and Field Studies:

1. ***Atmospheric Monitoring of UFPs*** by Philip M. Fine, Ph.D. Dr. Fine is the Manager for Climate Change/PM Control Strategies/Annual Emissions Reports/AB2588/Meteorology/Air Quality Evaluation/AQMP at the South Coast AQMD. He previously served as the Atmospheric Measurements Manager, responsible for all field activities of numerous special air monitoring projects focusing on air toxics and the local impacts of air pollution. Prior to joining the AQMD, he was a Research Assistant Professor at the University of Southern California, Los Angeles where he taught courses and conducted extensive research on particulate pollution and its health effects.

2. ***Concentrations of UFPs and Related Air Pollutants On and Near Roadways and in Other Urban Microenvironments*** by Dr. Eric Fujita, Ph.D. Dr. Fujita is a Research Professor in Division of Atmospheric Sciences at the Desert Research Institute, Reno. Dr. Fujita has 32 years of experience in managing and conducting air quality studies, including the LAX Air Quality Source Apportionment Study, Harbor Communities Monitoring Study, and numerous others. His research interests include chemical characterization of emission sources, reconciliation of emission inventory estimates for VOC and PM with ambient measurements, measurement and characterization of exposure to toxic air contaminants from mobile sources, and quantifying the relative contribution of gasoline and diesel exhaust to ambient PM. Prior to coming to DRI, Dr. Fujita was an Air Pollution Research Specialist for the Research Division of the California Air Resources Board (CARB).

DISCUSSION MEETING

At the March 14, 2012 meeting, the Council discussed the presentations and the materials received at the February 8, 2012 meeting and the draft report on that meeting. At the April 11, 2012 meeting, the Council discussed and finalized the revised draft report on the February 8, 2012 meeting.

KEY POINTS

Dr. Philip M. Fine

1. Methods for measuring UFPs are still being researched and developed. A wide range of instruments exists for purchase, with many technical and price differences each have precision or accuracy drawbacks. UFP measuring equipment is temperamental, takes skilled technicians to operate, and is difficult to calibrate (no NBS traceable standards exist.) The scientific community has not agreed upon the most representative or useful measurement. Total particulate mass is important for exposure and toxicity data, but particle number accounts for smaller particles that have greater health impacts. Particle number does not correlate to PM mass. Europeans measure heated samples with the volatiles driven off, but volatiles are important in impacting health.

2. Distance of samplers from sources matter. The zone of influence of UFPs is typically cited as within 300 m downwind of the source. The zone of influence can actually extend much beyond that, however, and is dependent on meteorological conditions and the effects of condensation and volatilization on particle size.

3. Filters can be effective in reducing indoor UFP concentration. For example HEPA filters are effective if installed and used properly, so that all outside air is drawn through them; but they are expensive.

4. The greatest exposure to UFP for most people occurs during their commute, as freeways are the largest sources of combustion-related UFP exposure. Jet take-offs from airports are also high, but are intermittent. Indoor UFP tends to be significantly lower than outside levels; though indoor sources such as cooking or laser printers can generate UFP.

5. Peak particle number for wood smoke near forest fires occurs at 200 nm. This is 5 to 10 times the particle size of the peak for vehicle emissions, which has a particle size number peak at about 20 nm.

Dr. Eric Fujita

1. Among the many sources of UFPs highlighted, auto oil burners and "gross emitters are significant sources. Aged oil emits less UFP than fresh (petroleum) oil. Zinc from engine oil is in the UFP size range, and researchers are unsure if synthetic oil will reduce UFP emissions.

2. In-vehicle exposure to UFP can be significant while driving, and is highly dependent upon emissions from vehicle immediately ahead. This exposure can be mitigated by rolling up windows and by relying on interior vehicle cabin air filters.

3. Cooking increases UFP count in public buildings by up to a factor of four.

EMERGING ISSUES FROM THE ADVISORY COUNCIL

New ideas, emerging information, and data from studies that the Advisory Council believes merit further investigation or analysis include:

1. EXPOSURE:

    a. Health effects are associated with both UFP number and mass.

    b. UFP exposures during commuting might be the greatest source of exposure for most people. Different ventilation options can greatly affect exposure level for commuters and those alongside roads.

    c. Indoor exposure to UFP is driven by indoor sources, such as cooking and wood burning.

    d. Better understanding is required of relationships between source concentrations and indoor concentrations of UFP. For example, one study correlated high UFP concentrations in back yards near an airport with high thrust take-offs of jet aircraft, and hence indoor UFP measurements at these locations were as much as 90% lower than outdoor measurements.

    e. Better understand is required between indoor UFP concentrations in schools compared to homes. Schools often have large HVAC systems and tend to have open windows. Filters can thus help reduce UFPs at schools.

    f. Filters are reasonably effective in preventing UFP entrance into indoor spaces, provided the filters are used correctly. Other mitigation strategies, such as tailpipe reductions, sound walls, and/or vegetative barriers may, however, be more important.

2. SOURCES OF UFP:

    a. Gross emitting vehicles are significant sources of UFP. On-road measurements are dominated by vehicles in front. Lubricating oil from "oil burners" is a UFP source.

    b. UFP from fuel combustion is the primary source of UFP.

    c. Two-cycle engines emit more UFPs than four-stroke engines.

d. The ACES study shows that model-year 2007 and later diesel engine UFP emissions are 90% lower than model-year 2004 levels.

e. Jet airplanes are important UFP sources near airports.

3. MEASUREMENTS:

a. The best long-term methodology for measuring UFP cannot be determined at this time for several reasons:

i. Adaptation of a UFP AAQS is years in the future. Particle count and chemical characterization of UFP near sources is the best that we can do now to quantify UFP emissions, exposures, and health impacts.

ii. UFP measurement methods are not yet as reliable as methods for measuring criteria pollutants. Variance between side by side monitors is greater than for other standardized measurements, and the equipment is "temperamental."

iii. Some particle measurements tend to validate the researchers' hypotheses. Measurements of the effect of atmospheric conditions on UFP may, however, yield new information, but the Air District should be cautious not to over commit money to new UFP measurements.

b. The Air District has purchased four state of the art particle UFP counters to develop information about sources and baseline concentrations, which will expand exposure information. They will also be able to study atmospheric impacts on UFP concentration and exposure.

ADVISORY COUNCIL RECOMMENDATIONS

The following Advisory Council recommendations to the Board are based on the above presentations and on subsequent discussions among Advisory Council members. The Air District should:

1. Continue development of its UFP program, including studies on air monitoring, source emission inventory, air quality modeling, exposure assessment, and health

impacts, leading to development of UFP mitigation strategies and to recommendations to minimize public exposure.

2. Prioritize the relative contribution and public health impacts of various sources of UFPs, i.e., vehicles, gross polluter autos, lube oil, jet air craft, outdoor cooking, indoor cooking, and indoor appliances.

3. Continue investigating questions such as the:

    a. UFP reductions from diesel engine controls for $PM_{2.5}$

    b. significance of wood smoke and other Bay Area sources of UFP listed above

    c. concentrations of UFPs generally, and the impact of atmospheric conditions

    d. interaction of mitigation methods for $PM_{2.5}$ and UFP.

4. Work with CARB and BAR to screen lube oil burners and raise awareness of the issue (see previous Advisory Council recommendations).

5. Determine the most effective and energy efficient HVAC filtration systems to mitigate UFP exposure, with a focus on schools, sensitive receptors, commuters, and people living or working near highways.

6. Integrate into the Air District's Public Education and Outreach efforts, the latest information on the UPC health effects and behavior-oriented recommendations to reduce exposure. Concepts for integration include awareness that:

    a. proximity to sources is the key issue. Most people are not exposed, except while on roadways or if they live near freeways.

    b. if you live or work within 300 meters of a major UPC source, keep windows and doors closed when possible.

    c. when driving, use recirculation, change cabin filters regularly, and avoid following high emitter autos.

    d. barbecuing and broiling food is a source of UFP, and so

        i. open window or turn on fan while broiling

ii. avoid smoke from BBQs

iii. avoid self-cleaning ovens or ventilate well.

e. time in confined garages and near wood fires (indoors and outdoors) should be minimized.

f. health-based advice should be provided to outdoor enthusiasts, such as bikers and joggers.

g. wood-burning is a personal/family health issue (indoors and outdoors), rather than just an environmental issue.

GLOSSARY

AAQS: Ambient Air Quality Standard

ACES: Advance Collaborative Emissions Study

AQMD

BAR: Bureau of Automotive Repair

Gross polluters: Vehicles with visible emissions or emissions that exceed CARB or BAR standards

HEPA

HVAC

micrometer or micron: One millionth of a meter; used as measure of particle diameter

nm: nanometer, or one billionth of a meter. Used as measure of particle diameter.

PM: Particulate matter, typically PM smaller than 10 or 2.5 microns; the largest $PM_{2.5}$ is 25 times larger than diameter of the largest UFP.

UFP: Ultra Fine Particulate, smaller than 100 nm