Summary Minutes of the
U.S. Environmental Protection Agency
Clean Air Scientific Advisory Committee (CASAC)
Public Meeting
March 10 – 11, 2010

Attendance:

CASAC Members:

Dr. Jon Samet, Chair
Dr. Christopher Frey
Dr. Joseph Brain
Dr. Helen Suh
Dr. Armistead (Ted) Russell
Dr. Kathleen Weathers (not present)
Dr. Donna Kenski (not present)

CASAC Particulate Matter Review Panel Members:

Dr. Lowell Ashbaugh
Mr. Ed Avol
Dr. Joseph Brain
Dr. Wayne Cascio
Dr. Christopher Frey
Dr. David Grantz
Dr. Joseph Helble (attended March 10 only)
Dr. Rogene Henderson
Dr. Philip Hopke (attended March 10 only)
Dr. Morton Lippmann
Dr. Robert Phalen
Mr. Tom Moore (not present)
Dr. Kent Pinkerton
Mr. Rich Poirot
Dr. Armistead (Ted) Russell
Dr. Frank Speizer
Dr. Helen Suh
Dr. Sverre Vedal
Dr. Kent Pinkerton (not present)
Dr. James Crapo (not present)

EPA Staff:

Zachary Pekar
Meredith Lassiter
Tim Hanley
Alex Macpherson
Steve Dutton
Vicki Sandiford
Mary Ross
Rich Demberg

Mark Corrales
Neil Frank
Bryan Hubbell
Pradeep Rajan
Connie Meacham
Beth Hassett-Sipple
Scott Jenkins
Tom Long
Molini Patel
John Vandenberg
Susan Stone
Jason Sacks
Lindsay Stanek
Genee Smith
Kirsten Simmons
Steve Dutton
Jennifer Richmond-Bryant
Kris Novak
Marc Pitchford (NOAA)

Public:

David Heinold, American Petroleum Institute
John Jansen, Southern Company
Anne Smith, Charles Rivers Associates
Harvey Richmond, Retired
Ken Yamashita, ADORC, Japan
Amin Nawahda, ADORC, Japan
Bryan Baldwin, Southern Company
Kurt Blasé, Coarse PM Coalition
Sonja Sax, Gradient Corporation
Cindy Langworthy, Hunton & Williams
Leland Deck, Stratus Consulting
Deborah Shprentz, American Lung Association (by phone)

Designated Federal Officer: Dr. Holly Stallworth, Designated Federal Officer

Purpose: To review the *Quantitative Health Risk Assessment for Particulate Matter – Second External Review Draft* (February 2010) and *Particulate Matter Urban-Focused Visibility Assessment – Second External Review Draft* (UFVA, January 2010).

Meeting Materials and Meeting Webpage:
http://yosemite.epa.gov/sab/sabproduct.nsf/bf498bd32a1c7fdf85257242006dd6cb/63a75420a265e70e852576700066c72d!OpenDocument&Date=2010-03-10
The following documents may be found at the above URL:

- Agenda
- Federal Register Notice

- Agency Briefing Material:
    - NAAQS for Particulate Matter (PM)--Schedule and Overview of Policy Assessment (Primary Standards)
    - EPA OAQPS Presentation: Risk Assessment to Support the Review of the PM NAAQS – Second External Review Draft
    - EPA OAQPS Presentation: Second Draft Urban Focused Visibility Assessment (UFVA) Secondary PM NAAQS Review
- Charge to the Committee:
    - Memo from Lydia Wegman to Holly Stallworth re: Policy Assessment Document with Charge Questions
    - Charge Questions Memo dated February 9, 2010 on the Risk Assessment for PM NAAQS
- Committee Members' Comments:
    - Preliminary Panel Comments on the Quantitative Health Risk Assessment
    - Preliminary Panel Comments on the Urban-Focused Visibility Assessment
    - Draft Letter on Risk Assessment, 3-11-10
    - Draft Letter on Urban-Focused Visibility Assessment, 3-11-10
- Public Comments:
    - American Lung Association Comments on PM Risk Assessment
    - Comments from Mr. Dirk Felton on UFVA
    - Presentation from Mr. David W. Heinold of AECOM on behalf of the American Petroleum Institute- Comments on the PM NAAQS:Urban-Focused Visibility Assessment
    - Utility Air Regulatory Group Comments on Urban Focused Visibility Assessment, prepared by Anne E. Smith, Charles Rivers Associates

Meeting Summary

The discussion followed the issues and general timing as presented in the meeting agenda.

WEDNESDAY, MARCH 10, 2010

Opening of Public Meeting

Dr. Stallworth convened the meeting with a statement reminding the audience that CASAC operates under the Federal Advisory Committee Act. Dr. Samet reviewed the agenda and expressed a desire to draft letters on each review document before the end of the meeting.

Dr. Karen Martin of EPA's Office of Air Quality Planning and Standards (OAQPS) presented the schedule as shown in "NAAQS for Particulate Matter (PM)--Schedule and Overview of Policy Assessment (Primary Standards)." Dr. Martin described a schedule that would culminate with a final rule by July 2011. Dr. Martin's overview of the Policy

Assessment covered the evidence-based and risk-based considerations as well as the indicator, averaging time, form and level of potential primary standards for fine particles. Dr. Martin stressed that issues related to cost and feasibility were not permissible as a basis for the Agency's decisions under the Clean Air Act. Ms. Beth Hassett-Sipple of OAQPS walked through the questions used to frame Chapter 2 of the Policy Assessment on fine particles and Dr. Scott Jenkins, also of OAQPS, spoke about the questions that framed Chapter 3 on thoracic coarse particles.

In presenting "Risk Assessment to Support the Review of the PM NAAQS – Second External Review Draft," Dr. Zach Pekar of OAQPS summarized the key enhancements and changes that were made since the first draft, particularly the integrative Chapter 6 which pulled together risk estimates from the urban study areas. Dr. Pekar offered supplemental information on long-term exposure-related mortality risk for an annual standard of 10 $\mu g/m^3$. Dr. Pekar described the methods used for simulating reduction of $PM_{2.5}$ (peak shaving, proportional rollback and hybrid rollback) and discussed the interplay of the annual and 24-hour design values and the peakiness of the $PM_{2.5}$ distributions in determining the degree of risk reduction throughout the 15 study areas. Dr. Pekar emphasized that annual standards provide more consistent level of public health protection relative to 24-hour standards.

Following Dr. Pekar's presentation, Ms. Sonja Sax of Gradient Corporation presented public comments on behalf of the American Petroleum Institute, emphasizing the uncertainties and variability in the epidemiological studies used to define the concentration-response functions for the risk assessment. Deborah Shprentz of the American Lung Association then presented comments by phone, lauding EPA for including the National Scale Assessment of Long-Term Mortality Related to PM2.5 Exposure (Chapter 5) and for estimating national risk down to the lowest measured levels. Ms. Sphrentz expressed a desire to see EPA conduct the full risk assessment for risks below 12 $\mu g/m^3$.

Following public comments, the Panel turned its attention to discussion of the charge questions. With respect to the charge questions on the urban case study analysis methods, panelists requested clarification on the differences between various rollback methods and voiced the need for a mathematical representation of each method. Panelists commended the authors for expanding and clarifying their rationale for identifying modeling choices however one member expressed reservations about the representativeness of the ACS cohort and another member expounded on the limitations of a mass-based metric. The emphasis on ischemic heart disease in the Risk Assessment was attributed to the use of the Krewski 2009 study which did not report cardiovascular endpoints. Members generally praised the Risk Assessment's treatment of uncertainty and variability, specifically the treatment of the concentration response function and different forms of the function. A couple of members offered the observation that EPA's core estimates were based on the low end of other alternative estimates.

With respect to the urban case study results, panelists were generally pleased with EPA's use of sensitivity analysis to support consideration of uncertainty in the core risk

estimates. EPA's new displays of 24-hour and annual design values with patterns of $PM_{2.5}$ monitoring data also garnered positive comments. With respect to the National Scale Assessment of Long-Term Mortality Related to $PM_{2.5}$ Exposure (Chapter 5), Dr. Pekar explained that the national estimates were based on a grid cell based CMAQ modeling run, along with a BenMAP incidence estimation model. Dr. Pekar also clarified that the national estimate was based on the lowest measured level of 5.8 $\mu g/m^3$.

After lunch, the Panel turned its attention to the integrated discussion of $PM_{2.5}$-related risks. One member said he was reassured that $PM_{10-2.5}$ would be discussed in the next document. Another member thought the figure of 88,000 premature deaths attributable to $PM_{2.5}$ would pose a risk of raising expectations about the benefits of lower PM levels. Another member thought the uncertainties associated with the national-scale estimate were overemphasized at the expense of highlighting clear conclusions. Again, the issue was raised of how low the annual standard should be in estimating risks and members offered different thoughts on a "stopping rule." Members also discussed the relationship between the Risk Assessment and the Policy Assessment and the extent to which non-scientific considerations might be driving the choice of alternative standards to model.

Having concluded its discussion of the charge questions on the Risk Assessment, the Panel heard a summary of the enhancements and modifications of the Second Draft UFVA from Ms. Vicki Sandiford of OAQPS. [See "EPA OAQPS Presentation: Second Draft Urban Focused Visibility Assessment (UFVA) Secondary PM NAAQS Review" posted at the URL above.] Ms. Meredith Lassier, the lead author on Chapter 5 on other welfare effects, summarized the treatment of climate effects, as well as effects on soils, nutrient cycling, water, flora and materials. Dr. Marc Pitchford of the National Oceanic and Atmospheric Administration summarized the new logit regression analysis on response curves from the 4 urban preference studies.

Panelists expressed positive opinions on the level of detail in the report and the extent to which the logit analysis provided additional support for comparing visibility preferences from the 4 cities. One panelist hypothesized that acceptable visibility might be a function of distance to the furthest visible feature. In response to a concern expressed about the Agency not being able to accommodate regional differences in visibility preferences, one panelist remarked on the relative convergence of visibility preferences across studies. General approval was expressed for the UFVA's use of a relative humidity (RH) screen to eliminate incidences of naturally occurring weather like fog, rain, snow, etc. The tile plots of hourly PM light extinction also garnered positive reviews. Several panelists noted that a visibility standard based on monitoring $PM_{2.5}$ only would capture the vast majority of light extinction, yet panelists recognized the key advantage of a light extinction indicator, namely that the indicator is the effect.

In response to a question about the relationship between visibility and health, Ms. Sandiford said this subject would be covered more in the Policy Assessment and that EPA wanted to include a person's sense of well-being in its assessment of the public welfare effect of visibility impairment, however it was not yet clear what kind of information on exposure duration was in the studies available thus far. Ms. Sandiford

referred panelists to the *Integrated Science Assessment* for a compendium of studies that identified a link between visual air quality and a person's sense of well-being.

Following a break, Ms. Hassett-Sipple and Dr. Martin offered remarks on the charge questions on the Policy Assessment. One member pondered why there were no questions on the use of the concentration-response function from the American Cancer Society (ACS) cohort as the basis for setting a standard given that the coefficients from the ACS cohort were the lowest among studies. Given the law's requirement for a "margin of safety," it was puzzling to this member that a central issue of the Policy Assessment was not addressed in the charge questions. In response to some members' call for greater specificity in the charge questions, Dr. Martin described a tension between trying to frame open-ended charge questions so that CASAC panelists could speak broadly versus directing panelists more narrowly to specific issues. Dr. Martin promised to revise the charge questions in response to panelists' comments.

Before adjourning for the day, Dr. Stallworth asked lead discussants to draft consensus responses to charge questions on both the Risk Assessment and the Urban-Focused Visibility Assessment so that she could prepare draft letters overnight to be reviewed the following morning.

THURSDAY, MARCH 11, 2010

Dr. Samet opened the meeting by stating his intention that the panel review the draft letters without using meeting time to do minor line-by-line editing. Panelists voiced general agreement with the draft letter on the Risk Assessment [dated 3-11-10 posted at the meeting URL]. Panelists discussed criteria for determining how low a PM level to evaluate in the Risk Assessment and whether to advise EPA to extend the scenarios to levels below 12 $\mu g/m^3$. Panelists pondered the extent to which consideration of potential NAAQS standards determines the set of scenarios considered in the Risk Assessment. Dr. Martin emphasized that the Risk Assessment was not the filter between the Integrated Science Assessment and the Policy Assessment and that lower PM levels could be contemplated in the Policy Assessment without having been the basis for core risk estimates in the Risk Assessment.

During the public comment period, Mr. Dave Heinold of the AECOM Technology Corporation commented on the Urban-Focused Visibility Assessment on behalf of the American Petroleum Institute, criticizing EPA's use of an extinction measurement at a single location over a one-hour period as inadequate to characterize a person's perception of urban visibility. Mr. Heinold said that an important factor was the effect of nitrogen dioxide that contributes to discoloration and reformulates the ratios of light seen by humans. Dr. Anne Smith of Charles River Associates provided comments on behalf of the Utility Air Regulatory Group (UARG) focusing on the statistics underlying the candidate protection levels of 20 to 30 deciviews that EPA used in the visibility assessment. Dr. Smith emphasized the heterogeneity across cities in visibility preferences and the preference malleability that was show in her previous study.

The Panel returned to discussing the draft letter on the Risk Assessment, picking up with charge question 6. Again, the issue surfaced of how low the assumed PM levels should go when conducting a risk assessment or modeling risk reduction for the national-scale assessment. Dr. Stallworth took note of comments on the draft letter.

After a break, the Panel discussed the visibility letter [dated 3-11-10 and posted at URL above] drafted overnight by Mr. Poirot. There was general agreement that the letter should recommend the addition of an integrated summary chapter. Panelists also agreed to export some of the minor comments to their individual comments to be attached to the main letter. Panelists debated how to comment on the heterogeneity in the preference studies and settled upon saying it is appropriate to move forward on the basis of available data, while noting that further research is needed to explore heterogeneity of preferences.

Dr. Stallworth asked Mr. Poirot to revise the draft letter on the Urban-Focused Visibility Assessment and Dr. Samet said he would revise the draft letter on the Risk Assessment. Both drafts would be circulated to the full Panel for their comments and posted prior to a final review to take place during the teleconference scheduled for April 8, 2010.

Before the meeting adjourned at 10:51am, Dr. Samet asked panelists to volunteer for charge questions on the Policy Assessment. Based on the list of volunteers for charge questions, Dr. Stallworth promised to send out revised charge questions (to be revised by Dr. Martin) tagged to lead discussants and subgroups with a request for written comments by the end of the month.

On Behalf of the Committee,
Respectfully Submitted,

Holly Stallworth, Ph.D. /Signed/
Designated Federal Officer

Certified as True:

Jonathan Samet, M.D. /Signed/
Chair, Clean Air Scientific Advisory Committee
Sulfur Oxides Primary NAAQS Review Panel

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by committee members during the course of deliberations within the meeting. Such ideas, suggestions, and deliberations do not necessarily reflect definitive consensus advice from the panel members. The reader is cautioned to not rely on the minutes represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters, or reports prepared and transmitted to the EPA Administrator following the public meetings.