

**Summary Minutes of the
U.S. Environmental Protection Agency (EPA)
Clean Air Scientific Advisory Committee (CASAC)
Oxides of Nitrogen Review Panel
Public Meeting
March 12-13, 2014**

Date and Time: Wednesday, March 12, 2014, 9:00 AM – 5:30 PM ET;
Thursday, March 13, 2014, 8:00 AM – 3:30 PM ET

Location: Hilton Garden Inn Durham Southpoint, 7007 Fayetteville Road, Durham, North Carolina, 27713

Purpose: The purpose of the meeting was to peer review EPA's *Integrated Science Assessment (ISA) for Oxides of Nitrogen - Health Criteria (External Review Draft – November 2013)* and *Integrated Review Plan (IRP) for the Primary National Ambient Air Quality Standards for Nitrogen Dioxide (External Review Draft)*.

Participants: CASAC Oxides of Nitrogen Review Panel (for full Panel, see roster¹)

Dr. Helen Suh, Acting Chair
Mr. George Allen
Dr. Matthew Campen
Dr. Ronald Cohen
Dr. Douglas Dockery (by phone)
Dr. Philip Fine (by phone)
Dr. Panos Georgopoulos (by phone)
Dr. Jack Harkema
Dr. Michael Jerrett
Dr. Joel Kaufman
Dr. Michael Kleinman
Dr. Timothy Larson
Dr. Jeremy Sarnat
Dr. Richard Schlesinger (by phone)
Dr. Lianne Sheppard
Dr. Ronald Wyzga
Dr. Jim Zhang

Mr. Aaron Yeow, Designated Federal Office (DFO)
Mr. Christopher Zarba, EPA SAB Staff Office
Dr. Erika Sasser, EPA Office of Air Quality and Planning Standards (OAQPS)
Ms. Beth Hassett-Sipple, EPA OAQPS
Dr. Stephen Graham, EPA OAQPS
Mr. Nealson Watkins, EPA OAQPS
Dr. John Vandenberg, EPA National Center for Environmental Assessment (NCEA)
Dr. Molini Patel, EPA NCEA
Dr. Reeder Sams, EPA NCEA
Other Attendees (See Attachment A)

Wednesday, March 12, 2014

Opening Remarks

Mr. Aaron Yeow, DFO, opened the meeting. He noted that as required under the Federal Advisory Committee Act (FACA), the Panel's deliberations are held in public with advanced notice given in the Federal Register², and the meeting minutes will be made publicly available after the meeting. He noted that there were two public comment periods noted on the agenda where members of the public registered in advance with the SAB Staff Office to make oral comments. He stated two clarifying comment periods on the agenda where members of the public could request an opportunity to provide short clarifying comments. He noted that the Panel received several written public comments, which were also posted on the meeting webpage. He stated that the SAB Staff Office determined that there were no issues with conflict-of-interest nor any issues with an appearance of a lack of impartiality for any of the Panel members. He noted that the CASAC and panel chair, Dr. Christopher Frey was unable to participate in the meeting and that Dr. Helen Suh graciously agreed to be acting chair. He then turned the meeting over to Mr. Christopher Zarba, Director of the SAB Staff Office, who welcomed everyone, and then turned it over to Dr. Helen Suh, Acting Chair.

Dr. Suh welcomed everyone and had the Panel members introduce themselves. She then provided an overview of the Agenda³.

EPA Presentation on Draft IRP

Dr. Erika Sasser, EPA OAQPS, made a presentation⁴ to the panel, providing an overview of the statutory requirements, the National Ambient Air Quality Standards (NAAQS) review process, the scope of the current review, and the anticipated schedule for the review. Ms. Beth Hassett-Sipple continued the presentation, providing an overview of the history of the primary NO₂ NAAQS, and the key issues in the current review.

Public Comments on the Draft IRP

Deborah Shprentz, Consultant to the American Lung Association, presented comments⁵ on the IRP, which focused on monitoring issues, the exposure assessment, and health risks.

Jacqueline Patterson, National Association for the Advancement of Colored People, was on the phone and presented oral comments which focused on misrepresentative exposure of certain communities, health impacts on susceptible populations, and suggested recommendations.

Julie Goodman, Gradient, presented comments⁶ on behalf of the American Petroleum Institute, which focused how the ISA did not follow the IRP in key considerations for determining causality, whether studies conducted at high exposure concentrations are informative regarding biological plausibility and modes of action and whether NO₂ is a surrogate for traffic-related pollution.

Discussion of the Draft IRP Charge Questions and Response to IRP Charge Questions

The Panel did not have any questions or comments on the general charge and proceeded to discuss their responses to the charge questions.

Overall Organization and Clarity; Chapter 1 – Introduction; Chapter 2 - Schedule

Panel members found these chapters to be straight forward and well written. There was some concern about the timing of the availability of sufficient NO₂ data from the near-road network relative to the need for these data to be used in the Risk and Exposure Assessment (REA) document.

Chapter 3 – Key Policy-Relevant Issues

Panel members indicated that the list of questions in the chapter seemed to adequately cover the key policy-relevant issues. The panel members had recommendations for other questions to be included. There was also the suggestion that the specific questions in the other chapters of the IRP be mapped to the overarching questions in this chapter.

Chapter 4 – Science Assessment

Panel members found this chapter to be well written and provided an excellent framework for the scientific questions that need to be addressed. They did not find the discussion of multipollutants and copollutants to be clear. They recommended that the IRP more clearly lay out the framework for how the EPA will approach this issue of separating out the effects of NO₂ from the effects of copollutants.

Chapter 5 – Quantitative Risk and Exposure Assessment

The Panel found the approach presented for the REA to be reasonable. They had some recommendations for conducting formal sensitivity and uncertainty analyses. The Panel stated that it was unclear how the EPA was going to utilize new methodological approaches and discussed several different methodological approaches for the EPA to consider using for the EPA. The importance of the new near-road monitoring network data was discussed and the Panel emphasized how useful the data would be for the REA. They also encouraged the EPA to explore other sources of NO₂ near-road concentration gradient data such as from the Multi-Ethnic Study of Atherosclerosis and Air Pollution (MESA Air) study team.

Chapter 6 – Ambient Air Monitoring; Chapter 7 – Policy Assessment and Rulemaking

The Panel indicated that Chapter 6 of the IRP needs to be reviewed for consistency with Chapter 4. There was discussion of new monitors that measured NO₂-only. They indicated that the monitoring network does not only serve the function of compliance, but also for informing exposure. The Panel did not have any major comments on Chapter 7.

Public Clarifying Comments on the Draft IRP

Doug Blewitt, Earth System Sciences, provided clarifying comments on the IRP, focusing on NO₂-only and total NO_x monitors, the AERMOD model not being evaluated against monitoring data, model evaluation, and including model uncertainty in the risk assessment uncertainty.

EPA Presentation on Draft ISA

Dr. John Vandenberg made a presentation⁷ to the panel, providing introductory remarks, the timeline for the ISA, and introducing the ISA team. Dr. Molini Patel continued the presentation, providing an overview of the content and scope of the ISA, then proceeded with an overview of each chapter and

their respective charge questions. Dr. Reeder Sams then gave an overview of the Health and Environmental Research Online (HERO) database.

The Panel was ahead of schedule and proceeded with the Discussion of ISA Charge and Response to ISA Charge Questions.

Discussion of ISA Charge and Response to ISA Charge Questions

The Panel did not have any questions or comments on the general ISA charge.

Chapter 2 – Atmospheric Chemistry and Exposure

The Panel found the chapter to appropriately cover summaries of monitored NO₂ concentrations. There was discussion of the exposure section needing to be reworked, and possibly separated into its own chapter. There was discussion about exposure and measurement error and how that affects epidemiological inference.

Public Comments on the Draft ISA

Deborah Shprentz, Consultant to the American Lung Association, presented comments⁸ on the ISA, focusing on the ISA being a rigorous and transparent assessment, susceptible populations, and NO₂ causing adverse respiratory effects.

Jacqueline Patterson, National Association for the Advancement of Colored People, had registered to speak, but was not present.

Julie Goodman, Gradient, presented comments⁹ on behalf of the American Petroleum Institute, focusing on the causality determinations, confounders, and modes of action.

Doug Blewitt, Earth System Sciences, presented comments¹⁰ on the ISA, focusing on oil and gas emissions and air quality impacts of oil and gas.

Response to ISA Charge Questions (cont'd)

Chapter 3 – Dosimetry and Modes of Action

The Panel generally found the chapter to be a comprehensive collection of information. They agreed that the current dosimetric models are not adequate for cross species comparisons, but underscores the need for such approaches. They recommended that the ISA explain what the models are lacking and also what the consequences result from the models not fully meeting needs. The Panel agreed that the reactive nature of NO₂ makes it unlikely to pass beyond the epithelial lining fluid, but a few points in the ISA were oversimplified and require additional detail to better highlight the role of NO₂ in pathophysiology. There was discussion about the modes of action section and how to improve it and reorganize it.

Mr. Yeow recessed the meeting for the day at 4:15 pm.

Thursday, March 13, 2014

The panel reconvened at 8:30 am.

Continued Response to ISA Charge Questions

Chapters 4 and 5 – Integrated Health Effects

The Panel generally found Chapters 4 and 5 to be a good start to summarizing the key results from the literature. They had concern about the treatment of potential confounders in delineating and evaluating the evidence associated with various studies. They recommended that the chapters be organized by health outcomes rather than study types. The Panel found that the issue of potential confounding by correlated co-pollutants (carbon monoxide, black carbon, some organic species, and ultra fine particulates) was an important concern and was not adequately or consistently addressed in the Draft ISA.

The Panel was asked to review a meta-analysis that had not yet been peer-reviewed. The Panel found the analysis to be reasonable and appropriate for use in the ISA, but had specific comments for improving the analysis.

The Panel discussed several of the causal determinations but was not able to achieve consensus on whether they agreed with the EPA's determinations. The noted the deficiencies with evaluating the issues of copollutants, confounding, etc. and stated that after the EPA addresses these issues in the Second Draft ISA, they would be able to better provide advice on the determinations.

Chapter 6 - Populations Potentially at Increased Risk

The Panel found that Chapter 6 presented clear information about at-risk factors. They recommended strengthening the chapter by having greater synthesis of the findings by risk factor. The Panel found the categorizations of at-risk factors to be appropriate, but had specific suggestions on expanding the categorizations.

Executive Summary and Chapter 1

The Panel found the Executive Summary to provide a good synopsis of key findings and conclusions, but suggested removing unnecessary jargon. The Panel had specific recommendations on reorganizing the Chapter 1 to provide a clear integrated synthesis.

Public Clarifying Comments on the Draft ISA

Julie Goodman, Gradient, presented clarifying comments¹¹ on behalf of the American Petroleum Institute, focusing on the causal framework, evaluating study quality, study information tables, outcomes examined tables, and using a scoring system.

Summary and Action Items

Dr. Suh discussed action items and the remaining schedule for drafting the reports.

The meeting was adjourned by Mr. Yeow at 2:15 pm.

Respectfully Submitted:

Certified as Accurate:

/SIGNED/

/SIGNED/

Mr. Aaron Yeow
Designated Federal Officer
EPA SAB Staff Office

Dr. Helen Suh
Acting Chair
CASAC Oxides of Nitrogen Review Panel

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from the Panel members. The reader is cautioned to not rely on the minutes to 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.

Materials Cited

The following meeting materials are available on the CASAC website: <http://www.epa.gov/casac>, at the [March 12-13, 2014 CASAC Oxides of Nitrogen Review Panel Meeting page](#):

¹ CASAC Oxides of Nitrogen Review Panel Roster

² Federal Register Notice Announcing the Public Meeting

³ Agenda

⁴ EPA Presentation - Review of the Primary NAAQS for Nitrogen Dioxide - Background, Schedule, and Draft Integrated Review Plan

⁵ Presentation on the IRP by Deborah Shprentz, Consultant to the American Lung Association

⁶ Presentation on the IRP by Julie Goodman, Gradient, on behalf of the American Petroleum Institute

⁷ EPA Presentation - Review of the Integrated Science Assessment for Oxides of Nitrogen – Health Criteria, First External Review Draft

⁸ Presentation on the ISA by Deborah Shprentz, Consultant to the American Lung Association

⁹ Presentation on the ISA by Julie Goodman, Gradient, on behalf of the American Petroleum Institute

¹⁰ Presentation on the ISA by Doug Blewitt, Earth System Sciences

¹¹ Presentation on the ISA by Julie Goodman, Gradient, on behalf of the American Petroleum Institute – 03-13-14

ATTACHMENT A – Other Attendees
CASAC Oxides of Nitrogen Review Panel Public Meeting

Public Attendees	Affiliation	Wednesday 3/12/14	Thursday 3/13/14
Blewitt, Doug	Earth System Sciences	X	X
Brown, James	EPA	X	X
Buckley, Barbara	EPA	X	X
Copley, Bruce	Exxon Mobile Biomedical Sciences Inc	X	X
Datko-Williams, Laura	EPA		X
Dutton, Steve	EPA	X	X
Fox, Tyler	EPA	X	
Goodman, Julie	Gradient	X	X
Graham, Stephen	EPA	X	X
Hemby, James	EPA	X	
Hassett-Sipple, Beth	EPA	X	X
Hines, Erin	EPA	X	X
Jansen, John	Southern Company	X	X
Jarabek, Annie	EPA		X
Jenkins, Scott	EPA	X	X
Kirrane, Ellen	EPA	X	X

Public Attendees	Affiliation	Wednesday 3/12/14	Thursday 3/13/14
Kotchmar, DJ	EPA	X	X
Langworthy, Cindy	Hunton & Williams	X	X
Luben, Tom	EPA	X	X
Madden, Meagan	EPA		x
McDow, Steve	EPA	X	X
Meacham, Connie	EPA	X	X
Nichols, Jennifer	EPA	X	X
Oakes, Michelle	EPA	X	
Orlin, David	EPA	X	X
Owens, Beth	EPA	X	X
Patel, Molini	EPA	X	X
Pinto, Joseph	EPA	X	X
Rappazzo, Kristen	EPA		X
Richmond-Bryant, Jen	EPA	X	X
Sacks, Jason	EPA	X	X
Sams, Reeder	EPA	X	
Sasser, Erika	EPA	X	X

Public Attendees	Affiliation	Wednesday 3/12/14	Thursday 3/13/14
Shprentz, Deborah	American Lung Association	X	X
Steichen, Ted	American Petroleum Institute	X	X
Stevens, Tina	EPA	X	X
Stewart, Michael	EPA	X	
Vandenberg, John	EPA	X	X
Watkins, Nealson	EPA	X	X
Wesson, Karen	EPA	X	X
Wilkie, Adrien	EPA		X
Wright, Barbara	EPA	X	X
Young, Brianna	EPA	X	X