

**Summary Minutes of the
U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee
Secondary National Ambient Air Quality Standards Review Panel for
Oxides of Nitrogen and Sulfur
Public Teleconference
February 29, 2016**

Date and Time: Monday, February 29, 2016, 2:00 p.m. – 5:00 p.m.

Location: By teleconference

Purpose: The CASAC Secondary NAAQS Review Panel for NO_x and SO_x discussed their draft report on EPA's Integrated Review Plan for the Secondary NAAQS for Oxides of Nitrogen and Oxides of Sulfur and then, the Chartered CASAC discussed the disposition of the panel's draft report.

Participants:

Members of the Clean Air Scientific Advisory Committee (CASAC) Secondary National Ambient Air Quality Standards Review Panel for Oxides of Nitrogen Oxides of and Sulfur

(Panel roster is provided in attachment A):

Dr. Ivan Fernandez
Dr. Edith Allen
Dr. Praveen Amar
Dr. Elizabeth Boyer
Dr. Douglas Burns
Ms. Lauraine Chestnut
Dr. Mark Fenn
Dr. James Galloway
Dr. Frank Gilliam
Dr. Daven Henze
Dr. Donna Kenski
Dr. William McDowell
Dr. Erik Nelson
Dr. Hans Paerl
Mr. Richard Poirot
Dr. Armistead (Ted) Russell
Dr. Stephen Schwartz
Dr, Kathleen Weathers

Members of the Chartered Clean Air Scientific Advisory Committee

(CASAC roster is provided in attachment B):

Dr. Ana V. Diez-Roux
Mr. George Allen

Dr. Judith Chow
Dr. Elizabeth A. Sheppard
Dr. Ronald Wyzga

EPA Science Advisory Board (SAB) Staff:

Dr. Sue Shallal, Designated Federal Officer
Mr. Aaron Yeow, Designated Federal Officer

EPA Representatives:

Ms. Ginger Tennant, EPA Office of Air Quality Planning and Standards
Ms. Karen Wesson, EPA Office of Air Quality Planning and Standards

Other Attendees:

A list of others who requested access to the teleconference is provided in attachment C.

Teleconference Summary:

Convene the Teleconference

Dr. Sue Shallal, Designated Federal Officer (DFO) for the Panel, convened the teleconference at 2:00 p.m. Eastern Time. She indicated that members of both the CASAC Panel and the Chartered CASAC would be participating in today's teleconference. She identified Panel members and CASAC members who were on the call. She noted that the Panel operated under the auspices of the EPA Clean Air Scientific Advisory Committee (CASAC), which is a chartered Federal Advisory Committee under the Federal Advisory Committee Act (FACA) and is empowered by law to provide advice to the EPA Administrator. She stated that summary minutes of the teleconference would be prepared and certified by the Chair. She noted that panel members are in compliance with ethics rules that apply to them. Dr. Shallal indicated that meeting materials were available on the CASAC website. These meeting materials included: the Federal Register Notice announcing the teleconference,¹ teleconference agenda,² Panel roster,³ draft Nitrogen Oxides and Sulfur Oxides Integrated Review Plan for Secondary (Welfare-based) National Ambient Air Quality Standards (NAAQS),⁴ Panel's Draft Report entitled, CASAC Review of the EPA's Draft Integrated Review Plan for the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur (NAAQS),⁵ PowerPoint presentation submitted by George T. Wolff, Ph.D. of the Air Improvement Resource, Inc. on behalf of The Alliance of Automobile Manufacturers,⁶ and Comments submitted by the Alliance of Automobile Manufacturers.⁷ She noted that time had been included on the agenda to hear oral public comments, and that one request had been received to present oral comments.

Review of Agenda and Purpose of the Teleconference

Dr. Ivan Fernandez, Chair of the CASAC Panel, reviewed the teleconference objectives and agenda. He indicated that the Panel was holding the teleconference to review the panel's report on the EPA document entitled the *Draft Integrated Review Plan for the Secondary National Ambient Air Quality*

Standards for Oxides of Nitrogen and Oxides of Sulfur (NAAQS). He noted that this was the second teleconference for the CASAC Panel. Dr. Fernandez indicated that during the first teleconference on December 1, 2015 the Panel deliberated on responses to EPA's specific charge questions and a draft Panel report was developed as a result of those discussions. Dr. Fernandez stated that the draft report had been circulated to panel members. Edits, comments and suggestions were received and incorporated into the revised draft report that is the subject of today's discussion.

Dr. Fernandez also indicated that on the call the Panel would first hear a presentation from one member of the public that had requested an opportunity to present oral comments. He also noted that following public comments the Panel, along with members of the Chartered CASAC, would begin their discussion of the Panel's draft report. Dr. Fernandez indicated that he would summarize the responses to each of the charge questions and then ask members of the panel and CASAC to provide comments. In addition, Dr. Fernandez noted that after the panel concluded their discussion, the Chartered CASAC members would determine the disposition of the draft report.

Public Comments

Dr. Fernandez stated that one member of the public had registered to provide oral comments. Dr. Fernandez called for comments from Dr. George Wolff on behalf of The Alliance of Automobile Manufacturers.

Comments from Dr. George Wolff

Dr. George Wolff of the Air Improvement Resource, Inc. spoke on behalf of The Alliance of Automobile Manufacturers. He said the CASAC Panel has correctly identified weaknesses in EPA's Plan. He commented that they include the concern that the IRP lacks specificity, lacks context in relation to the 2008 Review, and lacks an in-depth consideration of the uncertainties that were identified in the 2008 review and still exist. He stated that he supports CASAC's concerns in these areas and urges EPA to address them. He continued that there were other concerns raised by Panel members on form, implementation, and other N species. A number of individual CASAC comments raised questions about the appropriateness of using a secondary NAAQS for NO_x to regulate against the adverse effects of total N deposition. He commented that both EPA and Congress have historically decided that secondary NAAQS are not an appropriate approach to regulate regionally variable welfare effects.

Dr. Fernandez thanked Dr. Wolff for his comments and asked panel members if they had questions for Dr. Wolff. There were no questions for Dr. Wolff. Since there was some time available, Dr. Fernandez then asked whether any other members of the public on the call wanted to provide comments to the Panel. There were no additional comments so Dr. Fernandez indicated that the Panel would begin the discussion of the draft report.

Panel Discussion

Dr. Fernandez began by reading each Charge question and then summarizing the Panel's response.

Chapter 1 (Overall Organization and Clarity) – ***Charge Question #1: To what extent does the Panel find that the draft IRP clearly and appropriately communicates the plan for the current review of the***

secondary NO_x and SO_x NAAQS and the key scientific and policy issues that will guide the review? To what extent are the decisions made in the last review, including the rationales for those decisions, clearly articulated?

Dr. Fernandez stated that the panel agreed Chapter 1 was generally well written and identified tasks to be undertaken, but several areas required clarification or were lacking entirely. It lacked the details of why the existing secondary standard was not revised during the last review conducted in 2008. A clear explanation should be added of how uncertainties may have contributed to the decision by the Administrator NOT to adopt the requisite form of the standard, and how THIS review would address and resolve those uncertainties. Further clarity on the ‘form’ of the standard, the relevance of the aquatic acidification index (AAI) in light of considerations of form, and considerations for forms of nitrogen other than oxides of nitrogen, need to be addressed in this review beginning with this chapter.

Panel members and CASAC members discussed two revisions to the response to Question #1. They include, stating that the IRP was clear in identifying the four components of the “form” only but, needs further detail in other areas. Others suggested more clarity regarding the availability of data from the pilot study, or portions of it, should be included. Also, throughout the report, it was suggested that the word *form* (when referring to a chemical) be changed to *compound* to eliminate confusion with the “form” of the standard.

Chapter 2 (Key Policy Relevant Issues) – ***Charge Question #2:*** *Building on key considerations and issues addressed in the last review, Chapter 2 presents a set of policy-relevant questions that will serve as a focus in this review. To what extent does the Panel find that these questions appropriately characterize the key scientific and policy issues for consideration in the current review? Are there additional issues that should be considered?*

Dr. Fernandez summarized the response for Chapter 2 noting that the panel suggested more details on the process, outcomes, rationale, and issues from the 2008 review were needed while recognizing that this review is a separate process unto itself. The panel underscored the need to clarify how ‘level’ can be defined in the context of this review, and questioned whether, according to the Clean Air Act, a standard can be based on atmospheric deposition rather than on ambient air concentration. Visibility and effects on manufactured structures and cultural objects were not included in the IRP; the panel agreed that this omission should either be clearly justified or these effects should be included in this review. The terminology and concepts surrounding ‘ecosystem services’ require careful consideration, a clear definition, and consistent usage throughout the review process starting with usage in this chapter. The panel also suggested chemically reduced nitrogen, as well as organic sulfur, be included. Many of these issues could be addressed in this chapter as part of a more thorough discussion of the Aquatic Acidification Index, the panel noted.

Members agreed that the response to Question #2 was clear and did not require revisions.

Chapter 3 (Integrated Science Assessment) – ***Charge Question #3:*** *Chapter 3 describes the plan for the Integrated Science Assessment. To what extent does Chapter 3 clearly and adequately describe the scope, specific issues to be considered, and organization of the ISA? Please provide suggestions for any other issues that should be considered.*

Dr. Fernandez explained that the panel was generally supportive of the approach outlined for the ISA, with several suggestions for improvement. These included: addressing the importance of reduced forms of nitrogen; taking advantage of declines in ambient sulfate and nitrate deposition in the eastern United States, and increases in some areas in deposition of reduced forms of nitrogen, to document ecosystem response to these changes. Additionally, improving the discussion of the linkages among ecosystem components is important since they are understandably organized into separate sections of the chapter, but this inhibits discussion of the critical linkages among ecosystem components. And finally, as already noted in earlier chapters, further attention to the discussion of uncertainty was needed.

Members did not agree with the statement that deposition of chemically reduced nitrogen was increasing “particularly in the West”. They concurred that this statement should be removed.

Chapter 4 (Quantitative Risk and Exposure Assessment) – **Charge Question #4:** *Chapter 4 summarizes the key risk and exposure analyses from the last review, including associated uncertainties, and discusses our planned approach to considering the potential for additional analyses in the current review. To what extent does Chapter 4 clearly and adequately describe the scope and specific issues, including the identification of the most important uncertainties, to be considered in developing the REA Planning Document for this review? To what extent is there additional information that should be considered or additional issues that should be addressed in considering the potential for risk and/or exposure analyses in the current review?*

Dr. Fernandez said the panel concluded that since the REA depends on the ISA, the REA was described often in a very preliminary manner relative to the intended scope, issues to be considered, and organization. The panel was concerned that the IRP provided only preliminary ideas and does not constitute a plan, therefore the plan could not be adequately evaluated. He continued that the IRP should be broadened to include emissions as well as concentrations, deposition and impact. More detail in the discussion of various tools and models is needed along with a clear description of how these tools and models will achieve the answers to the risk and exposure questions. He also noted that the panel concluded the IRP needs to demonstrate the appropriateness of the models chosen for the objectives, and how that will be assessed. The panel also emphasized the need to go beyond just monetary endpoints and to clearly articulate the significance and measurement of biophysical or ecological endpoints. This chapter also needed to strengthen the discussion of uncertainty, including the addition of quantitative estimates for the magnitude of the uncertainties that are identified. The panel again noted the importance of reduced nitrogen and climate change considerations in the risk and exposure assessment.

Members suggested that more specificity was needed in the recommendation regarding the models to include the type of additional information that is being requested. It was also suggested that throughout the report, the term *monetary* should be replaced with the term *monetized*.

Chapter 5 (Policy Assessment and Rule Making) – **Charge Question #5:** *Chapter 5 describes the policy assessment and rulemaking process. To what extent does Chapter 5 clearly summarize the general process for the policy assessment and rulemaking phase of this review?*

Dr. Fernandez noted that the panel found Chapter 5 clearly summarizes the policy and rulemaking process, and appropriately lacks the details that are dependent on the ISA and REA assessments which are yet to be completed. The panel discussed the complexity and challenge in developing policy relevant

options and communicating them to the Administrator given the complexity of the issue of welfare effects. The panel encouraged EPA to think more broadly about the manner in which results are conveyed to the Administrator and public, advocating for both monetary benefits as well as alternative forms of the descriptions of benefits such as improvements in ecosystem services, tradeoff curves, visual representations and narratives of improved human experiences in natural landscapes.

Members suggested that the term *reduction* should be replaced with the term *decrease* to avoid confusion with a chemically induced “reduction” of a compound.

Letter to the Administrator

Dr. Fernandez commented that the letter outlines key issues highlighted by the panel and noted that more detail is contained in the report and individual member comments. The letter conveys the panel’s concern that the report lacks specificity and presents preliminary ideas rather than necessary details. A critical issue raised was the need to address more than just oxides of nitrogen, and the importance of including all forms of reactive nitrogen was emphasized. The letter points to an inadequate treatment of uncertainty in the IRP, which was of particular concern in the discussions of the Aquatic Acidification Index (or AAI) considerations during the 2008 review. Another important issue raised in the highlights has to do with confining the ‘form’ of the pollutant to air concentrations which may limit the ability of current regulations to achieve their goals. A critical question that needs to be answered is whether the Clean Air Act allows for forms other than concentration, such as deposition, to be the basis for this standard? The panel also recommended that more details on the models, and a broader utilization of models, including results from multiple models, be incorporated in the review process. The panel noted that the IRP is silent on manufactured structures, cultural objects, and visibility and these should be included, or a justification provided for their omission. Finally, the panel urges consideration of valuation measures that go beyond monetized values and include other measures such as biophysical outcomes.

Members agreed that the changes discussed for other parts of the report should be carried forward into the letter as well.

Clarifying Comments

There was no further discussion on the report. Dr. Fernandez thanked the Panel members for their comments and indicated that there was time available on the teleconference to hear brief clarifying comments from members of the public. He asked whether any members of the public wanted to provide clarifying comments. There were no requests to speak.

Dr. Shallal indicated that this was the conclusion of the revisions of the report and she handed the meeting proceedings over to Mr. Aaron Yeow, the DFO for the Chartered CASAC.

Summary of Chartered CASAC disposition of the panel’s report

Panel members asked about the process for finalizing the report. Mr. Aaron Yeow asked that the disposition of the report by the Chartered CASAC be decided before explaining the next steps. He introduced Dr. Ana Diez-Roux, Chair of the Chartered CASAC.

Dr. Diez-Roux asked members if there were questions or additional issues to be discussed. There were none, so she asked if CASAC members approved the report pending the incorporation of the agreed upon changes. All members concurred. Mr. Yeow then explained that the report would be revised and the new version would be shared with panel members and CASAC members for their final concurrence.

At the chair's request, the Designated Federal Officer adjourned the meeting at approximately 4:00 p.m.

Respectfully Submitted:

Certified as Accurate:

_____/s/_____
Dr. Suhair Shallal
Designated Federal Officer

_____/s/_____
Dr. Ivan Fernandez, Chair
CASAC Secondary National Ambient Air Quality
Standards Review Panel for Oxides of Nitrogen and
Sulfur

_____/s/_____
Dr. Ana V. Diez-Roux, Chair
Clean Air Scientific Advisory Committee (CASAC)

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 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.

ATTACHMENT A: PANEL ROSTER

**U.S. Environmental Protection Agency
Clean Air Scientific Advisory Committee
Secondary NAAQS Review Panel for Oxides of Nitrogen and Sulfur**

CHAIR

Dr. Ivan J. Fernandez, Distinguished Maine Professor, School of Forest Resources and Climate Change Institute, University of Maine, Orono, ME

MEMBERS

Dr. Edith Allen, Professor of Plant Ecology, Department of Botany and Plant Sciences, University of California Riverside, Riverside, CA

Dr. Praveen Amar, Independent Consultant, Environment, Energy, and Climate Strategies, Lexington, MA

Dr. James Boyd, Senior Fellow and Director, Center for the Management of Ecological Wealth, Resources for the Future, Washington, DC

Dr. Elizabeth W. Boyer, Associate Professor of Water Resources, Department of Ecosystem Science and Management, Pennsylvania State University, University Park, PA

Dr. Douglas Burns, Research Hydrologist, New York Water Science Center, U.S. Geological Survey, Troy, NY

Ms. Lauraine Chestnut, Managing Economist, Stratus Consulting Inc., Boulder, CO

Dr. Charles T. Driscoll, Jr., Distinguished Professor and University Professor of Environmental Systems Engineering, Department of Civil and Environmental Engineering, College of Engineering and Computer Science, Syracuse University, Syracuse, NY

Dr. Mark Fenn, Research Plant Pathologist, Pacific Southwest Research Station, USDA Forest Service, Riverside, CA

Dr. James Galloway, Sidman P. Poole Professor of Environmental Sciences, Department of Environmental Sciences, University of Virginia, Charlottesville, VA

Dr. Frank Gilliam, Professor, Department of Biological Sciences, Marshall University, Huntington, WV

Dr. Robert A. Goldstein, Senior Technical Executive for Water and Ecosystems, Electric Power Research Institute, Palo Alto, CA

Dr. Daven Henze, Assistant Professor and Charles C. Gates Faculty Fellow, Department of Mechanical Engineering, University of Colorado, Boulder, CO

Dr. Robert W. Howarth*, David R. Atkinson Professor of Ecology & Environmental Biology, Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY (did not participate in this teleconference)

Dr. Donna Kenski, Data Analysis Director, Lake Michigan Air Directors Consortium, Rosemont, IL

Dr. William McDowell, Professor of Environmental Science, Department of Natural Resources and the Environment, University of New Hampshire, Durham, NH

Dr. Erik Nelson, Assistant Professor, Department of Economics, Bowdoin College, Brunswick, ME

Dr. Hans Paerl, Kenan Professor of Marine and Environmental Sciences, Institute of Marine Sciences, University of North Carolina - Chapel Hill, Morehead City, NC

Mr. Richard L. Poirot, Air Quality Planning Chief, Air Quality and Climate Division, Vermont Department of Environmental Conservation, Montpelier, VT

Dr. Armistead (Ted) Russell, Howard T. Tellepsen Chair and Regents Professor of Civil and Environmental Engineering, Department of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

Dr. Stephen E. Schwartz, Senior Scientist, Environmental and Climate Sciences Department, Brookhaven National Laboratory, Upton, NY

Dr. Kathleen Weathers, Senior Scientist, Cary Institute of Ecosystem Studies, Millbrook, NY

SCIENCE ADVISORY BOARD STAFF

Dr. Sue Shallal, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

* While Dr. Howarth is a member of this panel, he did not participate in the review of the IRP.

ATTACHMENT B: CASAC ROSTER

U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee CASAC

CHAIR

Dr. Ana V. Diez Roux, Dean, School of Public Health, Drexel University, Philadelphia, PA

MEMBERS

Mr. George A. Allen, Senior Scientist, Northeast States for Coordinated Air Use Management (NESCAUM), Boston, MA, 02111

Dr. Judith Chow, Nazir and Mary Ansari Chair in Entrepreneurialism and Science and Research Professor, Division of Atmospheric Sciences, Desert Research Institute, Reno, NV, 89512-1095

Dr. Ivan J. Fernandez, Distinguished Maine Professor, School of Forest Resources and Climate Change Institute, University of Maine, Orono, ME, 04469-5722

Dr. Jack Harkema, Distinguished University Professor, Department of Pathobiology and Diagnostic Investigation, College of Veterinary Medicine, Michigan State University, Food Safety and Toxicology Building, East Lansing, MI, 48824

Dr. Elizabeth A. (Lianne) Sheppard, Professor of Biostatistics and Professor and Assistant Chair of Environmental & Occupational Health Sciences, School of Public Health, University of Washington, Seattle, WA, 98195-7232

Dr. Ronald Wyzga, Technical Executive, Air Quality Health and Risk, Electric Power Research Institute, Santa Cruz, CA 95060

SCIENCE ADVISORY BOARD STAFF

Mr. Aaron Yeow, Designated Federal Officer, U.S. Environmental Protection Agency, Science Advisory Board (1400R), 1200 Pennsylvania Avenue, NW, Washington, DC, 20460-0001

ATTACHMENT C: OTHER ATTENDEES

List of others who requested access to the teleconference

NAME	AFFILIATION
John J. Jansen	Southern Company
J. Kelly	EPA
Timothy A. French	Truck and Engine Manufacturers Association
Stuart Parker	Inside EPA
Laila Lackey	EPA
Lori Cherry	NC Division of Air Quality
Casey Deitrich	ASC Services, LLC
Lindsey Jones	TCEQ
Randy Waite	EPA OAR
Cindy Langworthy	Hunton & Williams, LLP
George Wolff	Air Improvement Resource, Inc.
Ross Smith	PotashCorp, PCS Administration
Alyssa Werthman	Ford
J. Burkett	Empire District Electric Company
David Pavlich	Phillips 66 Company
Susana Hildebrand	EFH
Larke Williams	EPA ORD

Materials Cited

The following meeting materials are available on the CASAC website, www.epa.gov/casac, on the February 29th meeting page of the Secondary National Ambient Air Quality Standards Review Panel for Oxides of Nitrogen and Sulfur.

<https://yosemite.epa.gov/sab/sabproduct.nsf/MeetingCal/8797F2618A82203785257F4C006ABFCA?OpenDocument>

¹ Federal Register Notice

² Agenda

³ Panel Roster

⁴ Draft Nitrogen Dioxide and Sulfur Dioxide Integrated Review Plan for Secondary (Welfare-based) National Ambient Air Quality Standards (NAAQS)

⁵ Panel's Draft Report entitled, CASAC Review of the EPA's Draft Integrated Review Plan for the Secondary NAAQS for Oxides of Nitrogen and Oxides of Sulfur

⁶ Presentation submitted by George T. Wolff, Ph.D. of the Air Improvement Resource, Inc. on behalf of The Alliance of Automobile Manufacturers

⁷ Comments submitted by the Alliance of Automobile Manufacturers

and Comments submitted to EPA on behalf of the Electric Power Research Institute (EPRI) on the proposed rule revising the Secondary NAAQS for NO_x and SO_x in 2011. (PDF, 224 pp., 12,029,905 bytes)