August 12, 2008

MEMORANDUM

SUBJECT: CASAC Review of Integrated Science Assessment for Oxides of Nitrogen and Sulfur – Environmental Criteria: Second External Review Draft

FROM: Ila Cote, Ph.D for Helen B. Walsh
Acting Division Director
National Center for Environmental Assessment –
Research Triangle Park Division (B243-01)

TO: Kyndall Barry
Designated Federal Officer
Clean Air Scientific Advisory Committee
EPA Science Advisory Board Staff Office (1400F)

Attached is the draft *Integrated Science Assessment for Oxides of Nitrogen and Sulfur – Environmental Criteria: Second External Review Draft* (ISA) prepared by the Environmental Protection Agency's (EPA) National Center for Environmental Assessment – Research Triangle Park Division (NCEA –RTP) as part of EPA's ongoing review of the national ambient air quality standards (NAAQS) for nitrogen dioxide (NO_2) and sulfur dioxide (SO_2). The draft ISA will be reviewed by the Clean Air Scientific Advisory Committee (CASAC) NOx and SOx Secondary NAAQS Review Panel (CASAC panel) at a public meeting to be held in Research Triangle Park on October 1-2, 2008. I am requesting that you forward the draft ISA to the CASAC panel to prepare for that review.

The purpose of the draft ISA is to identify, evaluate, and summarize scientific information on the ecological or environmental effects associated with exposure to nitrogen oxides and sulfur oxides. The ISA is intended to accurately reflect the latest scientific knowledge useful in indicating the kind and extent of identifiable effects on public health or welfare which may be expected from the presence of pollutants in ambient air (Clean Air Act, Section 108 (42 U.S.C. 7408). This draft ISA integrates the evidence on the environmental effects related to exposure to nitrogen oxides and sulfur oxides, and provides draft findings, conclusions and critical judgments on the evidence. The draft ISA is supported by a series of Annexes that provide more detailed information on the relevant evidence available in the areas of atmospheric sciences, ecological and welfare effects. The CASAC panel is being asked to review the draft ISA. NCEA-RTP will also address comments received on supporting material in the Annexes, to the extent that Panel members wish to review and provide comments on the Annexes.

Following the review of this second draft ISA, NCEA-RTP staff will prepare a final ISA that addresses comments received from the CASAC panel and the public; the court-ordered deadline for the final ISA is December 12, 2008

Charge to the CASAC Panel

We ask the CASAC panel to focus on the following questions in their review:

1. We have added an executive summary of the major findings and conclusions to the second draft ISA. We have also created a "key findings" section that is intended to provide highlights of these conclusions. We are seeking CASAC panel advice and comments on these additions to the ISA. To what extent do they provide an appropriate level of detail and convey the important scientific conclusions of the assessment?

2. Chapter 1 has been revised to clarify the scope or focus of this assessment on effects related to the deposition of nitrogen and sulfur compounds. In addition, we have added a discussion of the framework for evaluation of causality for assessing ecological effects. Do these revisions adequately characterize the scope of the assessment? Does the CASAC panel have recommendations for revisions to the causality framework? Is it appropriately applied in the draft ISA?

3. Chapters 2 and 3 from the first draft have been combined. Substantially more information has been included on NH_3 emissions, NH_3 measurement techniques, NH_3 and NH_4^+ concentrations. Additionally, information on NOx and SOx including ambient concentrations, deposition levels and their spatial and temporal relationships has been added. Have these revisions to Chapter 2 improved its assessment of the currently available scientific knowledge on atmospheric sciences and its relevance to the evaluation of environmental effects presented in later chapters?

4. We removed or eliminated redundancy, added summary sections, added additional references and reorganized Chapter 3. Revisions to the ecological effects sections are given below. Have the revisions improved the characterization of the ecological effects?

    a. Consistent with CASAC comments, we expanded our characterization of the quantification of chemical effects of acidification in aquatic ecosystems, added new conceptual diagrams, and further discussed interactions between acidification and plant disease.

    b. We expanded the discussion of quantitative relationships between nitrogen deposition and ecological effects, including published critical loads in the U.S. and Europe. In addition, the nitrogen enrichment section was expanded to include new discussions on carbon budgeting, biogenic nitrous oxide and methane. Information on the linkages between effects and both reduced and oxidized forms of nitrogen was emphasized, to the extent data were available.

c. The section on "other" welfare effects was updated to include information on the direct phytotoxic effects of nitric acid.

5. In revising the ISA, we have incorporated additional information on the indicators of exposure and ecological effects, including increased emphasis on quantified relationships in the presentation of information of results in tables and summary discussions in Chapter 4. What are the views of the CASAC panel on our revisions to focus on quantitative relationships between airborne nitrogen and sulfur compounds and ecological indicators?

We look forward to discussing these issues with the CASAC panel at our upcoming meeting. Should you have any questions regarding the draft ISA, please feel free to contact me or Dr. Tara Greaver (919-541-2435, email greaver.tara@epa.gov).

Attachments

cc: Vanessa Vu, SAB, OA
Peter Preuss, ORD/NCEA
Michael Slimak, ORD/NCEA
Ila Cote, ORD/NCEA
Debra Walsh, ORD/NCEA
Mary Ross, ORD/NCEA
Tara Greaver, ORD/NCEA
David Guinnup, OAR/OAQPS
Lydia Wegman, OAR/OAQPS