



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

January 31, 2011

**MEMORANDUM**

**SUBJECT:** CASAC Review of Monitoring Options for NO<sub>x</sub>/SO<sub>x</sub> Secondary NAAQS

**FROM:** Lewis Weinstock /*Signed*/  
Group Leader  
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Office of Air Quality Planning and Standards (D243-02)

**TO:** Ed Hanlon  
Designated Federal Officer  
Clean Air Scientific Advisory Committee Air Monitoring and Methods  
Subcommittee (AMMS)  
EPA Science Advisory Board Staff Office (1400R)

Attached are materials for review by the Clean Air Scientific Advisory Committee's (CASAC) Air Monitoring and Methods Subcommittee (AMMS). These materials will be the subjects of an advisory meeting by the AMMS Subcommittee, scheduled to be held on February 16, 2011. I am requesting that you forward these materials to the AMMS Subcommittee to prepare for the meeting.

This project, entitled *Monitoring methods and network design for the Secondary National Ambient Air Quality Standards (NAAQS) Review*, has been requested by EPA's Office of Air Quality Planning and Standards (OAQPS), within EPA's Office of Air and Radiation, in anticipation of a new secondary standard for oxides of nitrogen and sulfur. The meeting will cover monitoring methods relevant to the proposed Oxides of Nitrogen and Sulfur Secondary National Ambient Air Quality Standards (NAAQS) indicators, NO<sub>y</sub>, SO<sub>2</sub> and particulate sulfate.

The Clean Air Scientific Advisory Committee (CASAC) Oxides of Nitrogen (NO<sub>x</sub>) and Sulfur Oxides (SO<sub>x</sub>), referred herein as the NO<sub>x</sub>/SO<sub>x</sub> welfare panel, has advised EPA with regard to the ambient air indicators for consideration in our review of a new secondary standard for oxides of nitrogen and sulfur. The NO<sub>x</sub>/SO<sub>x</sub> welfare panel has endorsed the use of NO<sub>y</sub>, SO<sub>2</sub> and particulate sulfate as appropriate ambient air indicators. This AMMS subcommittee is charged with consulting EPA on the methodology and network design issues that would be used to measure these indicators. Charge questions associated with each indicator as well as supplemental measurements and network design are provided below. Work on this NO<sub>x</sub>/SO<sub>x</sub>

standard started in 2006 and has progressed through EPA's Integrated Science and Risk and Exposure Assessments and more recently in 2010 through two draft policy assessments (PA). The final PA is the subject of the February 15, 2011 meeting of the NO<sub>x</sub>/SO<sub>x</sub> welfare panel, which has been introduced to monitoring topics in the course of discussions on the ambient air indicators. In the second draft PA, chapter 8 described a variety of monitoring issues related to providing a measurement basis for the indicators, NO<sub>y</sub>, SO<sub>2</sub> and particulate sulfate. In our meetings with the NO<sub>x</sub>/SO<sub>x</sub> welfare panel, basically all discussions on monitoring were deferred to the AMMS subcommittee in the interest of efficiently using three correct mix of scientific expertise afforded by both panels.

The upcoming advisory meeting will support the EPA by providing scientific advice as the EPA Administrator considers potential revisions to the oxides of nitrogen and sulfur secondary standards; a notice of proposed rulemaking is to be signed by July 12, 2011.

Following this meeting, the Agency will issue a proposed rulemaking with regard to our review of the standard that will incorporate advice provided by the AMMS.

We appreciate the efforts of you and the Subcommittee to prepare for the upcoming meeting and look forward to discussing this project in detail on February 16, 2011. Questions regarding the enclosed materials should be directed to Dr. Richard Scheffe, EPA-OAQPS (phone: 919-541-4650; e-mail: [scheffe.rich@epa.gov](mailto:scheffe.rich@epa.gov)).

#### **Documents Associated with Subcommittee's Advisory Meeting:**

The purpose of the upcoming CASAC AMMS Subcommittee meeting is to provide advice on several aspects of the ambient air monitoring for the Oxides of Nitrogen and Sulfur Secondary National Ambient Air Quality Standards (NAAQS). The attached documents summarize the aspects being considered and provide various options under consideration. The Agency requests that the Subcommittee focus on the associated charge questions as part of its review.

- **Attachment 1** – Ambient Air Monitoring for a new secondary NAAQS for Oxides of Nitrogen and Sulfur.

This document originally was included as a chapter 8 (referenced above) in EPA's second draft policy assessment. However, the depth of questions related to monitoring in that document was far beyond the scope of the Clean Air Scientific Advisory Committee (CASAC) Oxides of Nitrogen (NO<sub>x</sub>) and Sulfur Oxides (SO<sub>x</sub>). Consequently, this document provides the background that associates the indicators with the potential use of available methods for deployment. This attachment provides background information for all charge questions.

- **Attachment 2** – Chapter 2 of the NO<sub>x</sub>/SO<sub>x</sub> PA.

This document provides a summary of monitoring networks, patterns of air quality based on

modeling results as well as information on atmospheric deposition, water chemistry and ecosystem modeling which is background information that helps understand how the indicator measurements relate to the form of the standard. This attachment provides background information for all charge questions.

- **Attachment 3** – Air Quality Observation Systems in the United States.

This document is a draft report developed by the air quality research subcommittee (AQRS) of the Committee for Environment and Natural Resources (CENR). It provides additional background on all U.S. observation systems and information regarding the strengths and weaknesses of current networks. The report provides insight to both methods selection and network design relevant to this secondary NO<sub>x</sub>/SO<sub>x</sub> standard. This attachment provides background information for all charge questions.

- **Attachment 4** - Rural Monitoring Networks.

This document is a short white paper that provides added background information for two specific charge questions (questions 9 and 12, below) related to network design and data uses.

- **Attachment 5** - Federal Reference Methods for NO<sub>y</sub> and p-SO<sub>4</sub> for the new combined NO<sub>x</sub> and SO<sub>x</sub> secondary NAAQS: Research Plan. This document provides EPA ORD's plans to develop FRM/FEM certification for NO<sub>y</sub>, particulate sulfate and sulfur dioxide. This attachment provides background information for charge questions 1, 2, 4 and 5.
- **Attachment 6** - Charge questions, which also follow below:

### **Charge to the CASAC NO<sub>x</sub> /SO<sub>x</sub> AMMS Review Panel**

We ask the CASAC AMMS Panel to focus on the charge questions listed below in regard to monitoring topics related to a potential secondary standard for oxides of nitrogen (NO<sub>x</sub>) and sulfur (SO<sub>x</sub>).

1. What are the Panel's views on using the CASTNET filter pack (FP) to measure particulate sulfate for the purpose of providing annual average values as an indicator for the NO<sub>x</sub>/SO<sub>x</sub> standard? Given EPA plans primarily to document the capability of the CASTNET FP and develop the FRM for particulate sulfate based on the existing information and procedures, what are the Panel's views of this approach for setting the FRM?
2. What are the Panel's views on using the CASTNET filter pack (FP) to measure sulfur dioxide gas for the purpose of providing annual average values as an indicator for the NO<sub>x</sub>/SO<sub>x</sub> standard? If EPA would document the capability of the CASTNET FP and

develops an FRM for sulfur dioxide gas based on the existing information and procedures, what are the Panel's view of this approach for setting the FRM?

3. What are the Panel's views on using the current primary FRM (high time resolution UVF) to measure sulfur dioxide gas for the purpose of providing annual average values as an indicator for the NO<sub>x</sub>/SO<sub>x</sub> standard?
4. What are the panel's views on using existing NO<sub>y</sub> methods that are deployed, for example, in NCore as the measurement approach for NO<sub>y</sub> for the purpose of providing annual average values as an indicator for the NO<sub>x</sub>/SO<sub>x</sub> standard? What are the panel's views on EPA's assessment that additional study is needed before establishing an FRM based on the existing NO<sub>y</sub> methods? That is, are the methods already adequately demonstrated as a reference method to determine compliance with a NAAQS? What are the panel's views on the research plan for establishing existing NO<sub>y</sub> methods as an FRM? [Note suggested improvement to the plan would be appreciated, particularly ones that would help complete the study on time.]
5. What are the panel's views on using the emerging AMoN ammonia monitoring network that uses passive sampling technology as a tool for evaluating air quality model behavior with respect to characterizing ambient air patterns of ammonia?
6. What are the panel's views on co-locating ammonia measurements at each location where the indicators are measured?
7. What are the Panel's views on using the CASTNET filter pack (FP) to measure ammonium ion as a tool for evaluating air quality model behavior with respect to characterizing ambient air patterns of ammonia?
8. What are the panel's views on establishing a suite of NO<sub>y</sub> species measurements at 2- 5 locations in different atmospheric and ecological regions for the purpose of evaluating air quality model and NO<sub>y</sub> instrument behavior?
9. What are the panel's views on utilizing the existing CASTNET and rural NCore networks as a starting infrastructure for the purpose of supporting the NO<sub>x</sub>/SO<sub>x</sub> standard?
10. What are the panel's views on using CASTNET filter pack (FP) to measure total nitrate (particulate nitrate plus nitric acid) as the measurement approach for the purpose of providing annual average values to support the NO<sub>x</sub>/SO<sub>x</sub> standard in diagnosing NO<sub>y</sub> instrument behavior and assist in delineating the relative fractions of contributing oxidized nitrogen species to total ambient oxidized nitrogen.
11. What are the panel's view of the broader consideration of using CASTNET, complemented by rural NCore, to serve as a framework for the nation's rural monitoring of important gases and aerosols in support of secondary standards and evaluating the behavior of regional air quality models?

cc:

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