



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

August 11, 2011

MEMORANDUM

SUBJECT: CASAC Advisory Meeting for Near-road NO₂ Monitoring Technical Assistance Document

FROM: Lewis Weinstock /*Signed*/
Group Leader
Ambient Air Monitoring Group
Office of Air Quality Planning and Standards (C304-06)

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

This memorandum requests the Science Advisory Board (SAB) Clean Air Science Advisory Committee's Air Monitoring and Methods Subcommittee (AMMS) to provide advice and ideas on how to improve the Near-road NO₂ Monitoring Technical Assistance Document (TAD). This memorandum contains the draft TAD and charge questions for review by the AMMS. These materials will be the subjects of an advisory teleconference call with the AMMS Subcommittee, scheduled for September 29, 2011. I am requesting that you forward these materials to the AMMS Subcommittee to prepare for the advisory.

This project, entitled *Near-road NO₂ Monitoring Technical Assistance Document*, has been requested by EPA's Office of Air Quality Planning and Standards (OAQPS), within EPA's Office of Air and Radiation. The advisory will cover the material and suggested approaches presented in the draft TAD. 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 September 29, 2011. Questions regarding the enclosed materials should be directed to Mr. Nealson Watkins, EPA-OAQPS (phone: 919-541-5522; e-mail: watkins.nealson@epa.gov).

Regulatory Background

On February 9th, 2010 revisions to the primary National Ambient Air Quality Standards (NAAQS) for NO₂, via final rule, were published. EPA tightened the NO₂ standard to include a 1-hour level of 100 ppb, 98th percentile form, averaged over three years, while retaining the

annually averaged NAAQS of 0.053 ppm. In support of this revision, EPA also promulgated new minimum monitoring requirements, of which a majority of the required monitoring is to be conducted near major roads. EPA relied on a body of scientific literature to finalize the near-road minimum monitoring requirements, which requires ambient monitoring to be conducted at the location of maximum NO₂ concentrations in an area, with a focus on characterizing those attributable to mobile source emissions. This near-road monitoring is required to be implemented to support the recently revised NO₂ NAAQS; however, the EPA believes that these near-road monitoring stations will create the infrastructure to accommodate other pollutant measurements. As such, EPA envisions these near-road monitoring stations as multi-pollutant monitoring stations.

Documents Associated with Subcommittee’s Advisory Meeting:

The purpose of the upcoming CASAC AMMS meeting is to provide advice and ideas on how to improve the Near-road NO₂ Monitoring draft TAD. The attached draft TAD is intended to provide state and local air monitoring agencies with recommendations and ideas on how to successfully implement required near-road NO₂ monitors. This draft TAD reflects the advice given to the EPA by the CASAC AMMS panel upon their feedback stemming from their review of EPA’s Near-road Guidance Document – Outline and the Near-road Monitoring Pilot Study Objectives and Approach in a letter dated November 10, 2010 ([http://yosemite.epa.gov/sab/sabproduct.nsf/ACD1BD26412312DC852577E500591B37/\\$File/EPA-CASAC-11-001-unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/ACD1BD26412312DC852577E500591B37/$File/EPA-CASAC-11-001-unsigned.pdf)). Further, the draft TAD has been developed by EPA through collaboration with multiple state and local air monitoring agencies, along with federal and state departments of transportation.

The Agency requests that the Subcommittee focus on the associated charge questions as part of its review.

Charge to the CASAC AMMS - Near Road NO₂ TAD Review Panel

We ask the CASAC AMMS to focus on the charge questions listed below in regard to the Near-road NO₂ draft TAD.

In the CASAC AMMS letter to the administrator regarding the review of the “Near-road Guidance Document – Outline” and “Near-road Monitoring Pilot Study Objectives and Approach” documents, the AMMS suggested that the objectives of the draft TAD be clarified so that they are clear and have a rationale.

Charge Question 1: Does the TAD, particularly based upon the information provided in Sections 1 and 2, provide clear objectives of the document and give appropriate rationale for the objectives?

In the CASAC AMMS letter to the administrator regarding the review of the “Near-road

Guidance Document – Outline” and “Near-road Monitoring Pilot Study Objectives and Approach” documents, the AMMS noted “...that the primary focus of the monitor site selection process is on annual average daily traffic (AADT). However, the approach may place too much weight on these data. Other factors to be considered include the physical characteristics and the patterns of vehicle use at the site...”. The EPA notes that in the NO₂ minimum monitoring requirements within 40 CFR Part 58 Appendix D, Section 4.3.2(a)(1), we require states to consider six factors in the site selection process: AADT, fleet mix, congestion patterns, roadway design, terrain, and meteorology. The Agency does not believe the rule places undue weight on AADT alone. The process suggested within the draft TAD to create a prioritized list of candidate road segments using traffic data in Sections 4 and 5, utilizes three of the six factors: AADT, fleet mix, and congestion patterns. The other three factors (e.g., roadway design, terrain, and meteorology) are discussed in Section 6.

Charge Question 2: Does the AMMS believe that the suggested approach in the TAD places an appropriate amount of weight and consideration on all six factors required to be considered (AADT, fleet mix, congestion patterns, roadway design, terrain, and meteorology) as part of the near-road NO₂ site selection process?

The EPA notes that the amount of heavy-duty (HD) or diesel vehicle volume on a road can have a significant impact on the overall NO_x emissions occurring on a road segment. In an effort to suggest a way for state and local air agencies to quantitatively compare all road segments in a Core Based Statistical Area (CBSA) that have varied AADT counts and HD vehicles counts for their traffic-volume based NO_x emission potential, the EPA created a unique metric called Fleet Equivalent (FE) AADT. For this metric, the EPA estimates (based on MOVES national default outputs for fleet mix, speed, ambient temperature, etc.) that HD vehicles emit approximately 10 times more NO_x than light-duty gasoline vehicles on a per vehicle bases. The FE AADT is introduced and explained in Section 5.

Charge Question 3: Does the AMMS see opportunities to improve the usefulness of the Fleet Equivalent AADT metric introduced and discussed within Section 5?

Section 6 contains the discussion of the impacts of roadway design, roadside structures, terrain, and meteorology on pollutant dispersion in the near-road environment, and gives suggestions of how state and local air agencies can take these effects into consideration in the site selection process.

Charge Question 4: Within Section 6, does the AMMS believe we have adequately described the effects of roadway design, roadway structures, terrain, and meteorology on roadway pollutant dispersion and suggested how those effects can be considered in the near-road site selection process?

Section 7 discusses the siting criteria in 40 CFR Part 58 Appendix E that are relevant to near-road NO₂ sites. This section also provides suggestions on satisfying siting criteria while accounting for physical characteristics of the target road, such as roadway design and roadside structures.

Charge Question 5: Within Section 7, does the AMMS believe we have adequately discussed the siting requirements and provided appropriate suggestions for how to properly site monitor probes while considering the design of the target road and/or roadside structures?

Section 8 discusses optional approaches on how to utilize exploratory monitoring to aid the near-road site selection process.

Charge Question 6: Does the AMMS believe that Section 8 has adequately discussed and explained the varied approaches on the optional use of exploratory monitoring as part of the near-road site selection process?

Section 9 discusses the option of using dispersion modeling to aid in the near-road site selection process. The TAD text is intended to provide a rationale on how modeling can be used, at a minimum, as a road segment comparison tool while it also can be for more elaborate analysis, which depends upon the availability of detailed traffic data.

Charge Question 7: Within Section 9, does the AMMS see opportunities to improve the description of how the (optional) use of AERMOD and MOVES can be used to conduct dispersion modeling in the near-road site selection process?

Section 10 provides state and local air agencies a list of suggested road segment characteristics that they should assess through the use of both remotely sensed imagery and field reconnaissance.

Charge Question 8: Within Section 10, does the AMMS believe the list of items needed to appropriately characterize individual candidate road sites is complete and adequately described? If the list is considered incomplete, please provide a list of the missing characteristics that should be included.

Section 11 is intended to provide state and local air agencies an understanding of what it will take to successfully engage their department of transportation (DOT) counterparts to negotiate the installation of a near-road monitoring site within DOT managed right-of-way. This section provides DOT related definitions, explanation of some existing DOT policies on access and safety in the near-road environment, and a list of questions that both DOTs and air agencies will likely need to answer for each other to determine if the placement of a monitoring station in the right-of-way is feasible.

Charge Question 9: From an air agency perspective, does the AMMS find that the definitions and explanation of transportation agency policies and expectations are adequate? Are there opportunities to improve upon the material presented within this section?

Section 13 provides suggestions on preparing for final site selection. In particular the TAD suggests that state and local air agencies assemble all the information acquired during the site selection process (e.g., all the information discussed in sections 3 through 11 of the TAD) into a candidate site comparison matrix.

Charge Question 10: Does the AMMS have ideas for improvement with respect to the organization and usefulness of the suggested site comparison matrix discussed within Section 13?

Section 14 presents information with respect to the potential to use near-road NO₂ monitoring sites as infrastructure that can support multipollutant monitoring efforts. This section presents a list of pollutants, and other parameters, that have been suggested through public comments and the AMMS (circa September 2010) for consideration of measurement in the near-road environment. Beginning with *Section 14.14 Black Carbon*, the pollutants are presented in the priority order suggested by the AMMS in their review of EPA's Near-road Guidance Document – Outline and the Near-road Monitoring Pilot Study Objectives and Approach in their letter dated November 10, 2010.

Charge Question 11: Does the AMMS:

- a. Concur with the order of presentation of each pollutant or metric of interest in the near-road environment, as was suggested by the previous AMMS panel, within Section 14?*
- b. Concur with the description of each pollutant or other metric discussed in Section 14, including its impact on human health (as appropriate), the reason for interest in the near-road environment, and the description or suggestions for measurement?*
- c. Believe that a pollutant or other metric should be removed from the list within Section 14, or that an unlisted item should be included within this section?*