Sunday, January 29, 2012

Workshop 2 - Challenges for Modeling Compliance With Short-term SO_2, NO_2, and $PM_{2.5}$ Ambient Standards and PSD Increments

Presenters:
Mr. Robert Iwanchuk, CCM, AECOM
Mr. Robert Paine, CCM, QEP, AECOM

Workshop Description:

The United States Environmental Protection Agency's (USEPA's) recently promulgated revisions to National Ambient Air Quality Standards (NAAQS) for SO_2 and NO_2 as well as implementation of modeling guidance for the $PM_{2.5}$ NAAQS and Prevention of Significant Deterioration (PSD) increments provide a host of compliance challenges. Given that these new NAAQS and increments are substantially lower than the previous levels they replace (for different averaging times or for PM_{10} in the case of $PM_{2.5}$), the customary degree of overestimation that is designed into the present Modeling Guideline (40 CFR Part 51, Appendix W) methods are limiting the ability of regulators and applicants to conduct accurate and unbiased air quality compliance assessments. Due to the shrinking margin of compliance associated with these new standards, the skill and application procedures of regulatory models such as AERMOD and CALPUFF will be more severely tested, and refined methods to incorporate background concentrations will need to be developed.

This workshop will provide an overview of $PM_{2.5,}$ NO_2, and SO_2 NAAQS (and PSD increment, as appropriate) implementation and dispersion modeling procedures. It will also review the current status of litigation filed against USEPA to challenge the new 1-hour NAAQS for NO_2 and SO_2.

An overview of the issues to be discussed for each of the three pollutants mentioned above is given below.

The need to carefully quantify $PM_{2.5}$ emissions, provide a control technology analysis, to explicitly model $PM_{2.5}$ emissions for compliance with the NAAQS and for compliance with PSD increments presents an unprecedented challenge for permitting new sources for the following reasons.

- $PM_{2.5}$ is formed from both primary and secondary emissions, which lead to modeling complications, primarily for long-range transport.
- The NAAQS for $PM_{2.5}$ is very restrictive, at current levels of 15 $\mu g/m^3$ for the annual average and to 35 $\mu g/m^3$ for the 98^{th} percentile daily average. USEPA is currently reviewing the annual standard, and a proposed level between 11-13 $\mu g/m^3$ is expected by the time of this workshop.

- The background concentration levels for $PM_{2.5}$ are already close to the NAAQS, where they are not already above the NAAQS.
- Since the $PM_{2.5}$ PSD increments are a small fraction of the PM_{10} increments (and the NAAQS ceiling may provide an even smaller increment in practice), there are considerable challenges for showing compliance with these low thresholds.
- Requirements for pre-construction monitoring for characterizing $PM_{2.5}$ concentrations will cause further delays in permitting efforts.

With the end to the PM_{10} surrogate policy, this workshop discusses the challenges and procedures for quantifying $PM_{2.5}$ emissions, controls, and modeling compliance with the $PM_{2.5}$ NAAQS and $PM_{2.5}$ increments.

We also address other important NAAQS challenges with the recently promulgated 1-hour NO_2 and SO_2 standards. These standards have created numerous permitting and compliance problems. Even without adequate modeling tools and policy guidance, USEPA has implemented requirements for permit applicants to model compliance with these new standards. For NO_2, the major issues are the conversion of NO to NO_2, available modeling procedures and approval requirements for refined approaches, regional background concentrations, and large resource commitments needed for cumulative modeling analyses and determining whether a new source significantly contributes to a modeled NAAQS violation.

For SO_2, there are similar modeling issues coupled with a significant change in EPA's approach to NAAQS implementation, particularly with respect to the nonattainment area designation process. EPA plans to place a greater emphasis on modeling as the most appropriate means of determining compliance with the one-hour standard. In fact, in areas without monitoring data, but with sources that might have the potential to cause or contribute to NAAQS violations, EPA anticipates that identification of NAAQS violations and compliance with the 1-hour standard would primarily be done through refined, source-specific dispersion modeling, even for areas initially designated as unclassifiable.

Instructors:

Mr. Robert Iwanchuk, CCM (AECOM)

Mr. Robert Paine, CCM, QEP (AECOM)

Mr. Iwanchuk has 38 years of experience in addressing issues related to air quality permitting and compliance issues for hundreds of facilities across the United States. He is AECOM Environment's corporate-wide NSR expert, responsible for tracking all NSR regulatory developments, providing regulatory interpretations and review of complex NSR projects for AECOM clients, and NSR training for client companies. During the course of his career, he has worked with many industrial facilities in conducting NSR applicability evaluations for facility modifications, historic PSD evaluations and providing assistance and strategy in the preparation of PSD and nonattainment New Source Review permit applications.

Mr. Paine has 36 years of experience in atmospheric dispersion modeling and has been involved in the design, coding, and evaluation of several advanced air quality dispersion models, including AERMOD, which is now preferred for short-range dispersion modeling. Mr. Paine has been involved in providing oral and written testimony for the NAAQS proposals and ongoing litigation, and has dealt with the implementation of modeling procedures on recent permitting projects.