

**U.S. Environmental Protection Agency  
Advisory Council on Clean Air Compliance Analysis  
Air Quality Modeling Subcommittee**

Public Teleconference  
March 15, 2010  
2:00 – 4:00 p.m. Eastern Time

**Minutes of the Meeting**

**Participants:**

Members of Air Quality Modeling Subcommittee: Ted Russell (Chair), Dave Allen, David Chock, Paulette Middleton, Ralph Morris, Jim Price, Chris Walcek (see AQMS Roster)<sup>1</sup>  
Council Members: Jim Hammitt (Council Chair), Rich Poirot  
EPA Staff: Stephanie Sanzone, SAB Staff Office; Jim DeMocker, Office of Air and Radiation  
Other: Andrew Childers, BNA Daily Environment Report; Leland Deck, Stratus Consulting

**Purpose:**

The purpose of the teleconference meeting was to discuss additional materials provided by the Agency regarding air emissions inventories and air quality modeling scenarios prepared for the Second Section 812 Prospective Study.

**Summary of Discussions:**

The meeting was announced in the Federal Register<sup>2</sup> and proceeded according to the meeting agenda, as revised<sup>3</sup>. Stephanie Sanzone, Designated Federal Officer for the AQMS, convened the call at 2:00 p.m. Eastern Time and called the roll. Dr. Ted Russell, Chair of the AQMS, reviewed the objectives for the meeting, and the suggested order of discussion. He stated the purpose of the meeting was to consider information provided by EPA since the February 19, 2010 meeting and to reach agreement on the March 5 draft AQMS report<sup>4</sup>, including how it would be modified based on this meeting.

The following is a summary of the issues discussed and conclusions reached during the meeting.

**A. Uncertainty.**

Following review of the draft document, *Second Prospective Analysis of Air Quality in the U.S.: Air Quality Modeling*, at its February 19, 2010 meeting, the AQMS requested additional information on the treatment of uncertainties for various components of the 812 Analysis.

Jim DeMocker, EPA staff lead for the 812 Study, gave a brief characterization of the materials provided to the AQMS, including a draft chapter on uncertainty<sup>5</sup>; an appendix describing existing literature on quantitative uncertainties for integrated air quality modeling systems, such as the Community Multiscale Air Quality (CMAQ) model<sup>6</sup>; and an appendix intended to provide insights on how EPA will characterize uncertainties across the 812 project components<sup>7</sup>.

The Subcommittee members agreed that the materials satisfied their questions about the nature of uncertainty information that would be provided to the Council, and reiterated their request that the modeling reports include references to the uncertainty reports/chapters.

## **B. Current Time Line for the Section 812 Study.**

In response to a question from Dr. Russell, Mr. DeMocker noted that Gina McCarthy, EPA Assistant Administrator for Air and Radiation, has reiterated her desire to have a completed, Council-reviewed 812 Study by September 2010. DeMocker acknowledged that some delay has resulted from the Team's discovery that PM transport factors had not been applied as intended. However, he described a proposed approach for adjusting the estimates of fine particulate matter (PM<sub>2.5</sub>) used to generate the primary estimate of benefits from the Clean Air Act Amendments (CAAA). The suggested approach includes adjusting the PM<sub>2.5</sub> emission inventories to account for fugitive dust transport, and scaling the CMAQ-projected PM concentration changes. He noted that the draft integrated report that will be sent to the Council in early April will contain placeholder numbers, but will be complete enough to allow the Council to review other aspects of the Study. Following the Council's meeting on May 4-5, 2010, the Agency will revise the integrated 812 report to incorporate the adjusted air quality scenarios, changes recommended by the Council, and updated estimates of benefits from the BenMAP model. The revised 812 report might be available in late June or early July for a final review by the Council.

DeMocker noted that the proposed approach does not include rerunning the CMAQ model because of time and resource constraints. The Subcommittee suggested that DeMocker check with EPA's Office of Research and Development (ORD) about possible assistance in rerunning CMAQ for the various *with* and *without-CAAA* air quality scenarios. If CMAQ is not rerun with the adjusted emissions inventories, this source of uncertainty in the air quality modeling results should be added to the summary uncertainty tables in the 812 report.

## **C. Use of MATS to Adjust CMAQ Outputs.**

The AQMS had requested additional information on the results from applying the Modeled Attainment Test Software (MATS) to CMAQ outputs for PM<sub>2.5</sub>, including some comparison by species of MATS-corrected concentration estimates to monitored PM<sub>2.5</sub>. Prior to the meeting, the Agency provided information on the methods used to create PM<sub>2.5</sub> air quality estimates by applying MATS to CMAQ results<sup>8</sup>. In addition, information was provided during the meeting on the comparison of CMAQ, MATS, and monitored PM<sub>2.5</sub> at three sample locations (Tulare County, CA; Morris County, NJ; Lawrence County, TN)<sup>9</sup> and MATS results at the three locations for *with* and *without-CAAA* scenarios<sup>10</sup>.

(Note: During the Subcommittee discussion, an error was noted in the data contained in one of the bar charts, and the chart was revised and resubmitted to the Subcommittee.)

Several members of the AQMS noted that the bar charts, once corrected, were useful in getting a qualitative understanding of the adjustments obtained by using MATS, and that the crustal masses in the *without-CAAA* scenarios looked plausible. The relatively small contribution of the crustal component to the total PM<sub>2.5</sub> after application of MATS may mitigate concerns over the CMAQ projections. One member of the AQMS raised the possibility that the estimation of crustal PM<sub>2.5</sub> may be influenced by the location of the monitors (e.g., near a source of crustal PM, location within the CMAQ grid cell).

The Subcommittee agreed that, in the absence of updated CMAQ model runs, it would be helpful to see similar comparisons of MATS results for *with* and *without-CAAA* scenarios for additional locations, with a focus on high population areas (e.g., cities with populations over 5 million), where the majority of health benefits from reduced PM<sub>2.5</sub> would occur. The Subcommittee requested that these additional comparisons be provided in bar chart format, as well as in data tables.

The Subcommittee discussed the importance of using MATS-adjusted estimates of PM<sub>2.5</sub> ambient concentrations for estimation of benefits, and noted that these data differ from the CMAQ outputs contained in the report submitted for AQMS review. Several members suggested that the draft report, *Second Prospective Analysis of Air Quality in the U.S.: Air Quality Modeling*, include a clear statement up front that the CMAQ outputs (e.g., results presented in Figure IV-20 of the draft modeling document) were not used directly to estimate benefits, but were adjusted using MATS in a subsequent step. Several members reiterated the importance of having documentation that summarizes the MATS procedures and results, since these estimates will be used to derive the benefit estimates; i.e., maps showing concentration results after MATS adjustments are more relevant than the maps contained in the draft CMAQ modeling report.

One Subcommittee member voiced concern with the use of the Particle and Precursor Tagging Methodology (PPTM) to develop maps of the contribution of emissions from source categories to the simulated PM<sub>2.5</sub> values, noting that the approach may lead to incorrect conclusions for any particular site. DeMocker noted that the emissions scaling could be refined without using PPTM.

#### **D. Corrections to PM Transport.**

The Agency had intended to apply Fugitive Dust Transport Factors (FDTF) to adjust PM emissions inventories prior to their input to the CMAQ model. However, through an oversight, this was not done. DeMocker described options for adjusting the inventories and the gridded concentration projections to more accurately capture PM<sub>2.5</sub> differences between the various scenarios without re-running CMAQ.

He requested Subcommittee feedback on Agency plans to:

1. adopt revised area source PM<sub>2.5</sub> inventories<sup>11</sup>;
2. use the *with-CAAA90* non-EGU inventories for both scenarios (i.e., zero out the reductions in non-EGU primary PM<sub>2.5</sub>);
3. use county-specific transport factors found at <http://www.epa.gov/ttn/chief/emch/dustfractions/> to adjust the county-level primary PM<sub>2.5</sub> inventories for both the *with* and *without-CAAA90* cases;
4. generate a set of adjustment ratios for the gridded CMAQ inputs (i.e., SMOKE data) which reflect the combined area source and fugitive dust changes in primary PM<sub>2.5</sub> emissions differentials between the *with* and *without-CAAA90* cases ;
5. use the grid cell-specific CMAQ input adjustment ratios to scale the CMAQ outputs for the primary PM<sub>2.5</sub> component in the same grid cells (i.e., assume away transport for area sources and fugitive dust); and
6. re-run MATS using the adjusted CMAQ results.

Subcommittee members generally agreed that the approach seemed reasonable, but that it would be important to examine the requested MATS results for additional cities. In addition, members stressed the importance of fully documenting the scaling procedure that will be applied to the emission inventories and CMAQ outputs. This information might be added to the draft report

describing the CMAQ modeling, or described in a separate document that also documents the MATS adjustment procedure and results, including the results of MATS with and without scaling of emissions. If the latter approach is taken, the draft CMAQ modeling report should include a note that errors in the PM2.5 inventories for area sources have not been corrected or misleading figures should be removed from the document.

**E. Next Steps.**

The Subcommittee discussed the merits of completing the current draft AQMS report based on currently available information vs. waiting for further results from the Agency as the refinements discussed above are implemented. The DFO noted that the AQMS could complete its work under the existing Charge to the Subcommittee, and submit the draft report to the Council in early April. A final decision on further advice to the Council from the AQMS could be made in the coming weeks, depending on the nature and timing of updated information from the Agency.

Dr. Russell requested that the Agency provide additional information for approximately 20 locations, including the speciated ReConstructed Fine Mass (RCFM) and MATS results for *with* and *without-CAAA* scenarios, so that the AQMS report can include the Subcommittee's conclusions on the use of MATS. DeMocker agreed that this likely could be provided in 1 to 2 weeks, but that results using the rescaled CMAQ results would not be available that quickly.

The DFO requested AQMS members to submit any edits or additions to the March 5 AQMS draft report, and noted that she would work with Dr. Russell to update the draft to include deliberations from this meeting and edits submitted by AQMS members. A revised AQMS draft report will be circulated to the AQMS for final concurrence, or concurrence with minor editorial comments, and then sent to the Council.

The meeting was adjourned at 4:00 p.m.

Respectfully Submitted:

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Stephanie Sanzone  
Designated Federal Officer

Certified as Accurate:

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Dr. Armistead Russell, Chair  
Air Quality Modeling Subcommittee  
Advisory Council on Clean Air  
Compliance Analysis

## Materials Cited

The following meeting materials are available on the Council Web site, <http://www.epa.gov/advisorycouncilcaa>, at the [March 15, 2010 AQMS Meeting](#) page:

- <sup>1</sup> Roster, Air Quality Modeling Subcommittee, March 15, 2010
- <sup>2</sup> Federal Register Notice Announcing the Meeting
- <sup>3</sup> Agenda for March 15 Teleconference
- <sup>4</sup> AQMS Draft Report (dated March 5, 2010)
- <sup>5</sup> *Chapter 3: Emissions and Air Quality Modeling Uncertainty* (excerpt from the draft stand-alone report on uncertainty to accompany the 812 Prospective Study. February 2010)
- <sup>6</sup> *Appendix B: Uncertainty Analysis of the Integrated Air Quality Modeling System* (excerpt from the draft stand-alone report on uncertainty to accompany the 812 Prospective Study. February 2010)
- <sup>7</sup> *Appendix C: Qualitative Uncertainty Summary Tables for Second Section 812 Prospective Analysis of the Clean Air Act* (excerpt from the draft stand-alone report on uncertainty to accompany the 812 Prospective Study. November 2009)
- <sup>8</sup> MATS Estimates of PM<sub>2.5</sub> Estimates for the Section 812 Scenarios. Memorandum from Leland Deck, Stratus Consulting to Jim Neumann, Industrial Economics, Inc. (March 9, 2010).
- <sup>9</sup> Three Sample STN Monitors, 2002 data. Bar chart presented to the March 15, 2010 AQMS meeting by Leland Deck, Stratus Consulting.
- <sup>10</sup> MATS Forecasts, 3 Sample Monitors. Bar chart, as corrected, presented to the March 15, 2010 AQMS meeting by Leland Deck, Stratus Consulting.
- <sup>11</sup> Revised Section 812 Nonpoint Source PM<sub>2.5</sub> Emission Estimates, Memorandum from Jim Wilson et al., Pechan & Associates, to Jim Neumann, Industrial Economics, Inc. (March 10, 2010).