

Draft Modeling Protocol for PM_{2.5}

Current Status



Regional/State/Local
Modeler's Workshop
Portland, Oregon
May 2010

NACAA August 5th Letter

- Increment, SILs and SMC Should Be Promulgated:
- Test Method 202 for PM2.5 Condensibles Should be Promulgated:
- AP-42 Emissions Factors Should be Issued for PM2.5:
- EPA Should Issue Guidance on Modeling Methods for PM2.5:
- EPA's Reconsideration of the NSR PM2.5 Implementation Should Not Modify the Three-Year Schedule for State SIP Revision:

NACAA Members – 54!

Misti Duvall

EPA/NACAA PM2.5 Modeling Protocols Workgroup – NACAA Members

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Goals and Purpose

Goals and purpose of the workgroup, the process forward, and how to best communicate the guidance.

It was decided that the goal would be to create a “best practices” guidance.

The protocol could also serve as a venue to identify and resolve issues.

The group assessed each of the 22 issues and decided that it was more appropriate for OAQPS to respond to most of the issues.

Some were more policy related and could be answered more simply.

These could be summarized on a Questions and Answers format with possible posting on the NSR's website.

Others required more review or analysis such as the Inter-pollutant trading ratios. In all cases the issues were separated into policy or technical categories.

Modeling PM2.5 in Attainment Areas

- ❑ 1. Receptor Placement. Reconcile with definition of Ambient Air?
- ❑ 2. What are the preconstruction ambient air monitoring requirements for PM2.5?
 - Does this include preconstruction monitoring of precursors?
 - Does the preconstruction monitor need to be a FRM or FEM?
- ❑ 3. How should background concentrations be accounted for in a NAAQS demonstration?
- ❑ 4. Should SILs be used in the interim until EPA finalizes these values?
- ❑ 5. Is compliance with the 24 hour (98th percentile) and annual NAAQS based on a 3 year average or maximum for each year?
- ❑ 6. Should the maximum impact or the 98th percentile in any given year be used to address issues under section 7.2.1.1c of the GAQM?
- ❑ 7. What are the requirements (if any) for addressing secondary formation of PM2.5 in the near field?
- ❑ 8. What are the requirements (if any) for addressing secondary formation of PM2.5 in the far field?
- ❑ 9. How to develop an emission inventory for both NAAQS and Increment?
- ❑ 10. What are the requirements for addressing condensible emissions in a modeling analysis?
- ❑ 11. Do we still need to model compliance with the PM10 annual and 24 hour NAAQS and Increments?
- ❑ 12. For EPA issued OCS source permits where the closest coast has a SIP approved PSD program, does the federal permit use PM2.5 or the PM10 surrogate policy?
- ❑ 13. Do permits that have been deemed complete under the PM10 surrogate policy need to address compliance with the PM2.5 NAAQS, Increment and preconstruction monitoring requirements.
- ❑ 14. The algorithm that will enable Aermid to calculate the 24 hour 98th percentiles should be added to the model. (This is already done for calendar years. Does this need a further look when site specific data which is not based on a calendar year is used?)

Modeling PM2.5 in Nonattainment Areas

- 1. How is a net air quality benefit test defined under section IV.A of Appendix S?
 - May a new source in a NAA have a significant impact in its NAA? What if there are modeled violations?
 - Which model should be used in order to show a net decrease if offset is in the near field? (Aermod is acceptable if the offset is within 50 km since it is unbiased)
 - Which model should be used in order to show a net decrease if the offset is located more than 50 km away?
- 2. Offsets may come from the same NAA or another NAA of equal or higher class provided it “contributes” to the NAA where new source is located.
 - How is a contribution test defined under section IV.D of Appendix S? Is it a “significant impact”?
 - Does the offset area need to contribute or the offset source?
 - What is the baseline date for eligible offsets?
 - Which model is sufficient to demonstrate contribution in the near or far field when offsets come from direct PM2.5?
 - Which model is sufficient to demonstrate contribution in the near or far field when offsets come from SO2 or other eligible precursors?
- 3. What are the requirements to allow inter-precursor trading between SO2 and PM2.5?
 - Does a State need to submit a “mini-SIP” in order to allow inter-precursor trading between PM2.5 and SO2?
 - Since trading ratios are not specified under Appendix S, is a demonstration and public comment required in order to use the default 40:1 ratio?
 - What are EPA’s requirements for EPA issued permits?
- 4. If source is major for PM2.5, when is SO2 regulated? (Ans: SO2 must also be a major 100 tpy source first. After that a modification of 40tpy would trigger nonattainment requirements.)
- 5. If source is minor for PM2.5, when is SO2 regulated? (Ans: same as above)
- 6. What are the requirements to include or exclude NOx, VOC or Ammonia as precursors in a State SIP?
 - May a “mini SIP” be submitted prior to entire NSR SIP?
 - How does a state demonstrate that these precursors are important?
 - Is a public comment period required
- 7. What offset trading ratios are allowed between any of the precursors?
- 8. May offsets of precursors come from PM2.5 attainment areas? (Ans: no).
- Remember PM2.5 Minor Source Program! What does this entail?

On a Technical side, AQMG is working on many of the issues identified. For example, the OTAQ Hotspot Guidance will contain information that could be used in PSD/NSR guidance. This may respond to receptor placement question.

The goal is to have consistency between NSR/PSD and General Conformity.

Of the 22 issues, there were 3 that could benefit from contributions of State participants. This included:

- “How to Develop a Modeling Emission Inventory for a Cumulative PM2.5 NAAQS Analysis”
- “How to Determine an Appropriate Background Concentration in a Cumulative PM2.5 NAAQS Analysis”
- “How to Address Secondary Formation in a PM2.5 Cumulative Modeling Analysis.”

EPA will provide bounds to guide the workgroup.

NACAA Subgroup Chairs:

Emissions Inventory - Jim Hodina

Air Pollution Control Officer,
Linn County, Public Health Air Quality Division

Background Concentrations - Clint Bowman

Air Quality Modeler,
Washington Department of Ecology

Secondary Formation - Bob Hodanbosi

Chief, Ohio EPA Division of Air Quality

Emissions Inventory: Subgroup

- Background: Emissions inventories for directly emitted PM_{2.5} of existing sources has not been formally developed and established by State and local agencies for purposes of permit modeling as part of cumulative impact analysis.
- Charge: Provide technical input and recommendations to EPA on development of PM_{2.5} emissions inventories for permit modeling including
 - current basis and approach for developing source estimates,
 - identification of data gaps and information needs,
 - recommended process or approach for more consistent and transparent efforts across State/local agencies.

Background Concentrations Subgroup

- Background: The determination of representative background monitored concentrations of PM_{2.5} to include in the Cumulative Impact Analysis will entail different considerations from those for other criteria pollutants. An important aspect of the monitored background concentrations is that the monitored data should account for the contribution of secondary formation representative of the modeling domain. Also, due to the important role of secondary PM_{2.5}, background monitored concentrations of PM_{2.5} are likely to be more homogeneous across this domain.
- Charge: Provide technical input and recommendations to EPA on more detailed guidance on the determination of representative background concentrations for PM_{2.5} including
 - Survey and critique of available options/approaches using ambient and modeled data
 - Potential criteria for critique for determining what is “representative”, and
 - Identification of data gaps and information needs

Secondary Formation Subgroup

- Background: The current preferred dispersion model for near-field PM_{2.5} modeling, AERMOD, does not account for secondary formation of PM_{2.5}. Therefore, any secondary contribution of the facility's or other modeled source's emissions is not explicitly accounted for. While representative background monitoring data for PM_{2.5} should adequately account for secondary contribution from background sources in most cases, if the facility emits significant quantities of PM_{2.5} precursors, some assessment of their potential contribution to cumulative impacts as secondary PM_{2.5} may be necessary.
- Charge: Provide technical input and recommendations to EPA on more detailed guidance on need for and approaches to account for secondary PM_{2.5} formation from project's precursor emissions including
 - suggested emissions thresholds and basis for when to include in both significant impact analysis and cumulative impact analysis,
 - critique of available options/approaches for accounting for project's secondary contributions, and
 - identification of data gaps and information needs.

Subgroups will provide EPA with Recommendations by the September.

Draft guidance with workgroup input.

Face-to-Face meeting/Webinar in Fall.

Early 2011 – Final PM2.5 Modeling Protocol.