

October 27, 2015

Gina McCarthy, Administrator
U.S. Environmental Protection Agency
Mail code 28221T
1200 Pennsylvania Avenue NW
Washington, DC 20460
Attention: Docket ID No. EPA-HQ-OAR-2015-0310

Re: *Revision to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches To Address Ozone and Fine Particulate Matter*

Dear Administrator McCarthy:

The Northeast States for Coordinated Air Use Management (NESCAUM) offer the following comments on the U.S. Environmental Protection Agency's (EPA's) proposed *Revision to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches To Address Ozone and Fine Particulate Matter* (hereinafter, the proposed revision) that was published on July 29, 2015 in the Federal Register (80 FR 45340-45387). NESCAUM is the regional association of air pollution control agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

NESCAUM thanks the EPA for its efforts in updating and revising the Modeling Guideline (also known as 40 CFR Part 51 Appendix W) based on the best and most current practices in the field of ambient air quality modeling. NESCAUM also thanks the EPA for the opportunity to comment on the proposed revision.

Two-tiered demonstration approach for addressing single-source impacts on ozone and secondary PM_{2.5}

Background

As described in preamble Section IV.A.6 (80 FR 45347-45348) of the proposed revision, the EPA intends to pursue separate rulemaking to establish a new demonstration tool for precursors of ozone and particulate matter with aerodynamic diameter less than 2.5 micrometers (PM_{2.5}), referred to as Model Emissions Rates for Precursors (MERP). NESCAUM understands that when this rulemaking is finalized, a qualitative analysis would suffice for a source with precursor emissions that are less than the level of the MERP. This would be analogous to the "Tier 1" assessment in the EPA's current *Guidance for PM_{2.5} Modeling* (EPA-454/B-14-001, May 2014).

Sources with precursor emissions above the level of the MERP would be subject to the two-tiered demonstration approach described in the proposed revision.

It is difficult to offer substantive comments on the proposed two-tiered approach discussed in the proposed revision until the EPA announces its proposal for the MERP. Comments on this particular aspect of the proposed revision (i.e., the two-tiered approach for sources with emissions above the level of the MERP) would be more meaningful once the EPA proposes the separate rulemaking to establish the MERP. As a specific example, it is not currently known whether the MERP will be based on a long-term (e.g., annual) or short-term (e.g., 8-hour, 24-hour) emissions period. A MERP based on annual emissions would not be an appropriate measure of whether those emissions will result in modeled concentrations that would meet a short-term standard (e.g., 8-hour ozone or 24-hour PM_{2.5}).

Comment 1

NESCAUM urges the EPA to release its proposal for a MERP as soon as possible. Furthermore, the EPA should not finalize the Modeling Guideline until the MERP proposal is released. Stakeholders should be given an opportunity to comment on this aspect of the proposed revision in the context of a proposed rulemaking establishing the MERP.

Comment 2

NESCAUM requests that the MERP should not be the sole demonstrator of whether a qualitative analysis is sufficient for a given source or whether further analysis is required. The reviewing authority should be able to consider other data and information (e.g., ambient monitoring data, other nearby emissions sources) in making such a determination.

Status of the CALPUFF model

Background

The EPA is proposing to remove CALPUFF as a preferred Guideline model for application in areas with complex terrain features (per Section 7.2.1.2 and preamble Section IV.A.7).

For valley locations in mountainous regions of the northeastern US, maximum impacts can occur during thermally stable conditions in the wintertime. The transport of emissions within the nighttime mixed layer occurs in a drainage flow regime that follows terrain channeling along the valley floor, therefore requiring a terrain-corrected spatially varying wind field model such as CALMET. CALMET/CALPUFF is designed to allow sufficient grid resolution to properly represent finer scale terrain features in a computationally efficient manner. Typical grid resolutions for prognostic model output (e.g., 4-km resolution) do not properly represent the finer scale terrain features in these types of valley locations. This level of representation of atmospheric flows is necessary for many modeling scenarios in complex terrain, especially considering the lack of available onsite meteorology in many of these situations.

The EPA is also proposing to remove CALPUFF as a Guideline model for long range transport assessment without promulgating a replacement. This may introduce inconsistencies in performing such analyses, and could in turn increase the amount of consultation and approval time on the part of the reviewing authorities, including the EPA Regional Offices and EPA Headquarters.

Comment 3

NESCAUM urges the EPA to retain the use of a refined modeling system with the capability to represent a spatially varying wind field (e.g., the CALMET/CALPUFF modeling system) in its Modeling Guideline.

Comment 4

NESCAUM recommends that CALPUFF be retained as a Guideline model for use in long range transport assessments and on a case-by-case basis for special situations, particularly those involving complex winds in certain valley locations.

The use of photochemical grid models in permit modeling demonstrations

Background

The EPA describes the need for photochemical grid models to be used in assessing single-source impacts on ozone and secondary PM_{2.5} in the preamble (Section IV.A.6) of the proposed revision. Although photochemical grid models have been extensively used for SIP planning purposes and other such applications, they have not been widely used to assess single source impacts in association with air permitting efforts. Photochemical grid modeling is usually performed at dedicated modeling centers with the staff, expertise, and computing resources necessary to conduct this very involved technical task. Individual state air agencies do not always have these resources available.

Comment 5

NESCAUM requests that the EPA provide resources (in the form of funding, training, or other available resources) to state and multi-jurisdictional agencies to assist these agencies in performing single-source photochemical grid modeling and reviewing modeling protocols, model inputs, and model outputs, especially given that these types of analyses may become more commonplace because of the requirements in the proposed revision.

Role of the EPA Regional Office in the usage of Tier 3 options for estimating nitrogen dioxide (NO₂) impacts

Background

As described in Section 4.2.3.4e of the proposed revision, regarding the use of a Tier 3 screening technique for the purposes of estimating NO₂ impacts, the EPA states that "...because of the additional input data requirements and technical complexities associated with the Tier 3 options, their usage shall occur in consultation with the EPA Regional Office in addition to the appropriate reviewing authority" (80 FR 45363).

Preferred Guideline techniques do not typically require Regional Office consultation or approval. Currently, Tier 3 methods (OLM and PVMRM) are considered non-regulatory/non-default, and therefore these methods require written petition and approval from the EPA Regional Office prior to their use in a regulatory context. With the proposed migration of these Tier 3 methods from a non-regulatory/non-default option toward becoming a preferred Guideline technique, it is not clear that consultation between the reviewing authority and the EPA Regional Office is necessary.

Comment 6

NESCAUM suggests that the EPA develop a technical assistance document to aid the reviewing authority in properly evaluating a request for use of a Tier 3 method (i.e., OLM or PVMRM) and how to make an appropriateness determination based on the methodology and data provided in such a request. This document would remove the necessity for consultation with the Regional Office on this matter. Should the EPA determine that consultation with the Regional Office is still necessary, NESCAUM requests that updated language be added to clearly define both the extent of the Regional Office's consultation role as well as what specific actions must be taken by the reviewing authority to satisfy the requirement for consultation.

Determination of urban and rural dispersion coefficients for tall stacks in small urban centers

Background

In Section 7.2.1.1.d, the EPA states, "For non-population oriented urban areas, or areas influenced by both population and industrial activity, the user will need to estimate an equivalent population to adequately account for the combined effects of industrialized areas and populated areas within the modeling domain" (80 FR 45368). The population size is a key factor in the determination of the urban dispersion coefficient.

In Section 7.2.1.1e, the EPA indicates that "[f]or analyses of whole urban complexes, the entire area should be modeled as an urban region, if most of the sources are located in areas that are classified as urban" (80 FR 45368). However, the EPA then suggests that some tall stacks may

be more appropriately characterized as rural if the stack height is above the urban boundary layer. There is little accompanying discussion of the process for excluding a tall stack in such a scenario, other than a suggestion for consultation with the appropriate reviewing authority and the AERMOD implementation guide.

On this topic in the revised AERMOD implementation guide (dated August 3, 2015), the EPA mentions that it has incorporated a formulation bug fix that modifies the treatment of plume rise for urban sources in version 15181 of AERMOD. With the bug fix, the EPA states that “a more thorough case-specific justification will be needed, in consultation with the appropriate reviewing authority, to support excluding [tall stacks located within or adjacent to small to moderate size urban areas] from application of the urban option.” The EPA does not, however, describe in detail what kind of justification will be sufficient to demonstrate that the rural option is more appropriate.

Comment 7

The EPA should explain the method to be used to calculate an effective population of the modeling domain.

Comment 8

NESCAUM requests that the EPA provide a more detailed explanation in its final Guideline for how to account for a tall stack in an urban area that has been approved for exclusion from application of the urban option. In the AERMOD implementation guide, NESCAUM requests that the EPA describe in greater detail what justification would suffice to show that the rural option is more appropriate than the urban option when comparing modeled impacts to observed monitored data in an urban area. For instance, the Cox-Tikvart method could be used to show that AERMOD with the rural option outperforms AERMOD with the urban option on a case-specific basis.

Prognostic Meteorological Data

Background

The EPA is providing guidance on the use of the Mesoscale Model Interface Processor to derive AERMOD-ready meteorological data from prognostic datasets produced by the WRF or MM5 meteorological models. These data would be acceptable for use in AERMOD modeling in cases where no representative measured surface data are available. Section 8.4.5.2 provides general recommendations on the evaluation of these model-produced datasets, but does not provide detailed recommendations on how the meteorological model should be run. There are many different ways these models can be used, and many decisions that need to be made when setting up a model run. The proposed revision states that the data from the meteorological model should be compared to observational data from the National Weather Service to be sure that the model is accurately replicating the observed meteorological conditions of the time periods modeled.

Comment 9

The EPA should provide more specific guidance on how the meteorological models should be run and how their output should be evaluated. Is it the responsibility of the permit applicant to furnish a statistical evaluation demonstrating that the model output is accurately replicating observed conditions? Permitting authorities may not have the staff resources to adequately review and evaluate WRF or MM5 modeling exercises if there are no standards for how these models are to be used.

The introduction of PVMRM2

Background

As the EPA stated in the preamble Section IV.A.4, Tier 3 screening methods for NO₂ modeling have been available for years and have been well evaluated by the modeling community. The EPA is proposing that a revised formulation of PVMRM (called PVMRM2) be incorporated as a Guideline default method, despite the fact that PVMRM2 has not been available to the modeling community until very recently.

Comment 10

NESCAUM feels that the time period spanning from July 29, 2015 (i.e., the date of the Federal Register notice for the proposed revision and the concurrent release of AERMOD version 15181 that contains this option) to October 27, 2015 (i.e., the close of the comment period for the proposed revision) is not sufficient for the modeling community to evaluate this option. NESCAUM requests that both PVMRM and PVMRM2 be retained as non-default options for a period of one year after the close of the comment period so that the PVMRM2 option can be more thoroughly evaluated. At the end of this more adequate evaluation period, the EPA could issue a clarification memorandum to formalize guidance on the use of PVMRM2.

Miscellaneous

NESCAUM offers the following additional comments on various sections of the proposed revision.

- Comment 11: On p. 45362, in Section 4.2.1.3.c Screening in Complex Terrain, the term “unresolvable problems” is used. The word “unresolvable” implies just what it means, not solvable. Perhaps a term like “unforeseen challenges” would be better in this context.
- Comment 12: The phrase “multiply the Tier 1 result(s) by the Ambient Ratio Method 2” (p. 45363, Section 4.2.3.4.d Models for Nitrogen Dioxide) is somewhat misleading because NESCAUM understands that ARM2 is an empirical equation embedded in the model and therefore does not require any external multiplication.

- Comment 13: On p. 45364, Figure 4-1, there appears to be a typo in the second box of the figure. NESCAUM believes the phrase “Multiply Tier 2 results by an appropriate ambient ratio” should be “Multiply Tier 1 results by an appropriate ambient ratio.”
- Comment 14: On p. 45370, Section 8.2.2.c *Source Data*, Requirements, the statement is made: “For purposes of situations involving emissions trading refer to current EPA policy and guidance to establish input data.” This is a vague statement; the policy and guidance should be explicitly referenced.

If you or your staff have any questions regarding the issues raised in these comments, please contact Paul Miller of NESCAUM at 617-259-2016.

Sincerely,



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Executive Director

cc: NESCAUM Directors
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