Texas Commission on Environmental Quality Comments on Revisions 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

Docket ID Number EPA–HQ–OAR–2015–0310

The Texas Commission on Environmental Quality (TCEQ) provides the following comments on the U.S. Environmental Protection Agency’s (EPA) proposed rule referenced above. The proposed rule was published in the July 29, 2015, issue of the *Federal Register* (80 FR 45340)*.*

# Background

On July 29, 2015, the EPA proposed revisions to the Guideline on Air Quality Models (“Guideline”). The Guideline has been incorporated into the EPA’s regulations, satisfying a requirement under the Clean Air Act (CAA) section 165(e)(3) for the EPA to specify, with reasonable particularity, models to be used in the Prevention of Significant Deterioration (PSD) program. *The Guideline* provides EPA-preferred models and other recommended techniques, as well as guidance for their use in predicting ambient concentrations of air pollutants. The proposed revisions to the Guideline include enhancements to the formulation and application of the EPA’s American Meteorological Society/EPA Regulatory Model (AERMOD) near-field dispersion modeling system and the incorporation of a tiered demonstration approach to address the secondary chemical formation of ozone and fine particulate matter (PM2.5) associated with precursor emissions from single sources. Additionally, the EPA proposes various editorial changes to update and reorganize information throughout the Guideline to streamline the compliance assessment process.

# TCEQ Comments

The EPA solicited comments on substantive proposed changes to the Guideline that are intended to improve the science of the models and approaches used in regulatory assessments. The TCEQ appreciates the opportunity to comment.

## I. Clarifications to Distinguish Requirements from Recommendations

The EPA solicited comments regarding the appropriateness of the revisions in providing the necessary clarity on the requirements under the proposed revisions to the Guideline, as distinct from the recommendations in the revised text, while noting the continued flexibilities provided for within the Guideline, including, but not limited to, the use and approval of alternative models.

The TCEQ supports the continued flexibility provided in the proposed Guideline. Many case-by-case air quality analyses involve unique characteristics that are not specifically addressed in general guidance. As a result, it is critical that the *Guideline* continue to allow for flexibility based on sound technical judgement when air quality analyses are conducted.

## II. Updates to the EPA’s AERMOD Modeling System

The EPA invited comments on whether they have reasonably addressed the technical concerns expressed by the stakeholder community. The EPA also solicited comments regarding whether they are on sound footing to recommend these updates to the regulatory default version of the AERMOD modeling system, which includes the replacement of the buoyant line and point source (BLP) dispersion model as an appendix A model for the intended regulatory applications.

The TCEQ supports the proposal to make the surface friction velocity adjustment option (ADJ\_U\*) in AERMET a part of the regulatory default version. This option correlates with field study data during stable, low wind speed conditions known to be associated with model overprediction.

Similarly, the TCEQ supports the proposed LOWWIND3 model option in AERMOD since it addresses issues with model overprediction under low wind speed conditions.

For the proposed buoyant line source option (BOUYLINE), the AERMOD/BLP Development and Testing support document includes information on the evaluation procedures used to incorporate the BLP model into AERMOD. For the 1-year scenario (tables 12-14, pp. 13-16), the support document notes the 1-hour concentration estimates were found to be vastly different, and the differences have not been investigated in detail. The TCEQ suggests that the proposed line source option (BOUYLINE) be included in AERMOD as a non-default/beta option, and that the BLP model continues to be listed as a preferred model until further investigation can be conducted.

## III. Status of AERSCREEN

The EPA invited comments on the incorporation of AERSCREEN into the Guideline for use as the screening model for AERMOD that may be applicable in applications in all types of terrain and for applications involving building downwash.

For purposes of fully documenting the Screening Models and Techniques section of the proposed Guideline (section 4.2.1), the TCEQ finds it reasonable to mention that AERSCREEN and CTSCREEN are screening versions of the preferred models AERMOD and CTDMPLUS (Complex Terrain Dispersion Model Plus Algorithms for Unstable Situations), respectively. However, the TCEQ does not agree that the screening models should be referred to as preferred/recommended screening models. Listing AERSCREEN as a preferred/recommended screening model may limit the use of well understood, simple to execute, and widely used screening models such as SCREEN3. The purpose of the screening models is to provide a simple, yet conservative, method to determine if more complex refined modeling is needed. It has been TCEQ’s experience that AERSCREEN, compared to previous screening models, is rarely used by permit applicants due to the complexity of setting up and running the model. This often leads to costly, refined modeling that would not be necessary if the applicant used SCREEN3.

## IV. Updates to 3-Tiered Demonstration Approach for NO2

The EPA invited comments on whether they have reasonably addressed technical concerns regarding the 3-tiered demonstration approach and specific NO2 screening techniques within AERMOD, and whether they are on sound foundation to recommend the proposed updates.

The TCEQ supports the flexibility provided in the proposed Guideline for establishing alternative default minimum NO2/NOx values based on a source’s in-stack emissions ratios for the proposed Tier 2 approach.

The TCEQ requests clarification regarding the current Tier 2 approach, (Ambient Ratio Method [ARM]), and its continued use. The Technical Support Document (TSD) for NO2-related AERMOD modifications provides a comparison between the existing ARM and the proposed ARM2 for the annual averaging period. The comparison shows that the application of the existing ARM (factor of 0.75) is conservative. The TCEQ encourages the EPA to consider allowing the continued use of the existing ARM approach as a conservative technique given its familiarity and ease of use within or outside of a model platform as an alternative to the use of ARM2.

The TCEQ supports the inclusion of the Tier 3 screening approaches (Ozone Limiting Method [OLM] and Plume Volume Molar Ratio Method [PVMRM]) as part of the regulatory default version of AERMOD. The TCEQ also encourages the EPA to continue to evaluate these screening techniques for future refinements to address tendencies of model overprediction (as is proposed with the PVMRM2 model option).

## V. Addressing Single-Source Impacts on Ozone and Secondary PM2.5

The EPA invited comments on whether the proposed two-tiered demonstration approach and related EPA guidance is appropriately based on sound science and practical application of available models and tools to address single-source impacts on ozone and secondary PM2.5.

The TCEQ supports having flexibility in conducting the analyses for secondarily formed pollutants based on the recommended two-tiered approach. However, the TCEQ also encourages the EPA to continue developing draft guidance related to the recommended two-tiered approach by including additional examples that could meet the intent of the first tier. Additionally, the EPA should substantiate the claim at 80 *FR* 45348 that most projects should be able to demonstrate compliance with the proposed first tier and/or provide specific guidance on what qualifies as evidence for first tier screening level, in order to ensure national consistency.

The TCEQ supports the development of screening tools to assist with the evaluation of secondarily formed pollutants, specifically, Significant Impact Levels (SILs) and Model Emissions Rates for Precursors (MERPs) for PM2.5 and ozone. Since these screening tools are currently not available, the TCEQ cannot provide specific comments at this time; however, the TCEQ does support the development of screening tools to assist with the process and looks forward to the future rulemaking. The TCEQ encourages the EPA to complete rulemaking for the SILs and MERPs before the proposed revisions to the Guideline are final.

The TCEQ has reviewed the EPA document, *Guidance on the use of models for assessing the impacts of emissions from single sources on the secondarily formed pollutants ozone and PM2.5 (draft) [EPA-454/P-15-001, July 2015]*, and offers the following comments on this draft guidance document:

1. On page 10, the EPA states, “A candidate model for use in estimating single source impacts on secondarily formed pollutants such as ozone and PM2.5 for the purposes of permit review programs should meet the general criteria for an ‘alternative model’ outlined in 40 CFR part 51, Appendix W, section 3.2 (U.S. Environmental Protection Agency, 2005). The acceptability of a particular model and approach for that model application is an EPA Regional Office responsibility that should include consultation with EPA’s Model Clearinghouse, if appropriate.” The TCEQ urges the EPA to specifically state and assert that the Comprehensive Air Quality Model with Extensions (CAMx) and the Community Multiscale Air Quality (CMAQ) models are “preferred models” for the second tier of assessment associated with the proposed two-tier approach. While these models have been used for State Implementation Plan (SIP) development and have been extensively evaluated and peer-reviewed, they are not customarily used in air permitting. Therefore, it would be helpful for the EPA to specifically name these models.
2. On pages 15 and 16, the EPA discusses selection of modeled episodes for secondarily-created PM2.5 and ozone. While the EPA’s recommendations for episode selection are reasonable, the EPA has not accounted for the burden this represents to applicants and states. First, episode selection requires many weeks of analyses of monitoring and/or meteorological data, depending on the number of secondary pollutants required for the study, because ozone-conducive episodes are often different than PM2.5-conducive episodes, and multiple years of high episodes may need to be analyzed to find those that have the necessary duration to pursue. The EPA’s paragraphs specify the types and lengths of episodes necessary to be studied for each, and EPA is assisting, perhaps, by not requiring or recommending more than one year in episode length, so it appears that the EPA is suggesting that applicants or states could set up preferred episodes for each pollutant. However, these analyses would need to be performed for each meteorologically-distinct area of the state, and meteorological datasets, as well as emissions inventories, would have to be generated for each. The EPA has not addressed how often applicants or states would need to update the episodes selected, i.e., when an episode is “too old.” The EPA should refer readers to additional guidance such as the EPA’s “Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze.” For national consistency, the EPA should address these issues.
3. On page 18, the EPA discusses sub-grid plume treatment and sampling where there is close proximity between source and receptor. In general, the TCEQ supports the use of these in-plume chemistry model options, and acknowledges the complexities of resolving “total ground level concentrations,” especially as source apportionment is applied.
4. On page 21, the EPA discusses the use of the absolute contribution estimate by a photochemical grid model as being appropriate in single-source permit applications. While this may be appropriate for sources distant from ozone monitoring sites, in cases where a site is nearby, for example within 20 kilometers, it should be utilized to correct potential model biases as is done in SIP attainment demonstrations. Tools such as the EPA’s Model Attainment Test Software (MATS) or the TCEQ Attainment Test for Unmonitored Areas (TATU) could be used to apply the model in a relative sense for every modeled day, not just the peak days.
5. On page 27, the EPA suggests that an alternative trade ratio may be established during a Second Tier analysis, but provides no background, details, or examples. The TCEQ suggests that the EPA provide examples, or simply state that the EPA is open to interpollutant trading ratios of precursors that differ from 1:1.

## VI. Status of CALPUFF and Assessing Long-Range Transport for PSD Increment and Regional Haze

The EPA invited comments on its proposed screening approach to address long-range transport for purposes of assessing PSD increments; its decision to remove the California puff model (CALPUFF) as a preferred model in appendix A for such long-range transport assessments; and its decision to consider CALPUFF as a screening technique along with other Lagrangian models to be used in consultation with the appropriate reviewing authority.

The TCEQ supports the proposed screening approach of using the modeling results from the appropriate near-field screening/preferred model at 50 kilometers to determine the significance of the impacts with respect to Class I PSD increments for distances beyond 50 kilometers. The TCEQ also supports the continued use of CALPUFF as part of a screening analysis.

However, there are aspects of the text in the proposed Guideline that are unclear. Section 4.2(c) introduces the proposed screening approach, and subsections 4.2(c)(i) and 4.2(c)(ii) represent the first level and second level of assessment for the screening approach, respectively. Subsection 4.2(c)(ii) (second level assessment) notes, “For assessment of Class I significance of ambient impacts and cumulative increment analyses, there is not a preferred model **or screening approach** for distances beyond 50 km.” (Emphasis added.) Yet, the text in section 4.2(c) characterizes both subsections as part of a screening approach. The TCEQ suggests that the first sentence of section 4.2(c)(ii) be removed and the section read as follows: “The EPA Regional Office shall be consulted in determining the appropriate and agreed upon modeling approach to conduct the second level assessment. Typically, a Lagrangian model may be the type of model used for this second level assessment, but applicants shall reach agreement upon approaches (models and modeling parameters) on a case-by-case basis. When Lagrangian models are used in this manner, they shall not include plume-depleting reactions, such that model estimates are considered conservative, as is generally appropriate for screening assessments.”

## VII. Role of EPA’s Model Clearinghouse

The EPA invited comments on the proposal to codify the existing practice of requiring consultation and coordination between the EPA Regional Offices and the EPA's Model Clearinghouse on all approvals under section 3.2 of alternative models or techniques.

As part of the model selection process for use in a given situation, the TCEQ understands and appreciates the need for fairness, consistency, and transparency in making modeling decisions among the EPA Regional Offices and other state, local, and tribal agencies. However, the TCEQ is concerned that having the Model Clearinghouse review and provide formal concurrence memoranda for use of alternative models has the potential to add a significant amount of time to the permit review process. The TCEQ suggests that the EPA Regional Offices maintain the flexibility to approve the use of alternative models while keeping the option to coordinate and seek guidance from the Model Clearinghouse as needed.

## VIII. Updates to Modeling Procedures for Cumulative Impact Analysis

The EPA invited comments on whether the updates proposed in section 8 of the Guideline and associated guidance are appropriate and sufficient to provide the necessary clarification in selecting and establishing the model inputs for conducting the regulatory modeling for PSD and SIP applications.

With regard to conducting a cumulative impact analysis for a National Ambient Air Quality Standard (NAAQS) demonstration (*see S*ection 8.2.2 (c) of the proposed Guideline), the TCEQ supports the approach of relying on actual emissions data for nearby sources. Related to this, the TCEQ encourages the EPA to develop guidance on estimating short-term actual emissions data for use with models as was done for the 1-hour SO2 designation process. S*ee* SO2 NAAQS Designations Modeling Technical Assistance Document.

In addition, the discussion provided in section 8.2.2 (c) of the proposed Guideline is geared towards a NAAQS compliance demonstration. The TCEQ encourages the EPA to develop similar discussion points for purposes of conducting a cumulative PSD increment analysis.

With respect to identifying which sources to explicitly include in the modeling (“nearby” sources), the TCEQ understands that this can be a difficult process that can be affected by a number of variables, and supports the flexibility to use professional judgment in making these determinations.

## IX. Updates on Use of Meteorological Input Data for Regulatory Dispersion Modeling

The EPA solicited comments on the proposed updates regarding use of meteorological input data for regulatory application of dispersion models.

The TCEQ supports having the option to rely on multiple sources for obtaining meteorological data for dispersion modeling, including the use of the Weather Research and Forecasting (WRF) prognostic meteorology model in conjunction with the EPA’s Mesoscale Model Interface program (MMIF) conversion tool for improved meteorological fields. Furthermore, the TCEQ encourages the continued flexibility for how those meteorological data are processed for use with dispersion models.

## X. Transition Period for Applicability of Revisions to the Guideline

The EPA invited comments on whether it would be appropriate to apply a 1-year transition after promulgation of the revised Guideline so that applications conducted under the current Guideline with approved protocols would be acceptable during that period. The new requirements and recommendations would be used for applications submitted after that period or for protocols approved after that period.

The TCEQ supports a 1-year transition period after promulgation of the revised Guideline so that applications conducted under the current Guideline with approved protocols would be acceptable during that period.

## XI. Proposed Editorial Changes

The EPA invited comments on changes proposed for the Guideline text.

Section 4.2.1.1(c) of the proposed Guideline lists the averaging time scaling factors for AERSCREEN. The factors listed represent the factors used for SCREEN3 and differ from the factors listed in the AERSCREEN user’s guide. The TCEQ requests that the EPA clarify this apparent discrepancy.

The TCEQ encourages the EPA to add additional flexibility when designing receptor grids. While section 9.2.2(d) of the proposed Guideline discusses receptor placement, most of the guidance focuses on receptor density, and no consideration is given to the potential for public exposure. Several barriers such as railway right-of-way and controlled access highways could be present that would restrict public exposure. The additional flexibility would need to account for the form of the NAAQS and NAAQS averaging time as well as an evaluation of the likelihood for the public to be present at the particular location.

The TCEQ has found that many of the documents the EPA references in Appendix W are not readily available to the public. The TCEQ requested some of these documents and were advised that most of them are journal articles or Air and Waste Management conference materials; as a result, there are copyright issues with the EPA posting them in the docket and providing copies. In addition, the EPA advised the TCEQ that most of the non-copyrighted materials are old, and could be labor-intensive to locate and make available. The TCEQ requests that the references included in the proposed *Guideline* be located in a central area available from the EPA’s Support Center for Regulatory Atmospheric Modeling (SCRAM) website. Providing the documents in a central area would lend transparency to the rulemaking process and allow the general public to adequately comment on the proposal.