TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 6, 2013

Mr. Guy Donaldson, Chief
Air Planning Section (6PD-L)
Environmental Protection Agency
1445 Ross Avenue
Suite 1200
Dallas, Texas 75202-2733

Re: Draft Guidance for One-Hour Sulfur Dioxide (SO_2) Nonattainment Area State Implementation Plan (SIP) Submissions

Dear Mr. Donaldson:

The Texas Commission on Environmental Quality (TCEQ) appreciates the opportunity to respond to the United States Environmental Protection Agency's (EPA) request for comment on the Draft Guidance for One-Hour Sulfur Dioxide (SO_2) Nonattainment Area State Implementation Plan (SIP) Submissions. The draft guidance was dated October 28, 2013 and made available to states, including Texas, for comment on October 31, 2013. Via teleconference, the EPA announced that the deadline for comments is December 6, 2013.

Detailed comments on the draft guidance are enclosed. If there are any questions concerning the TCEQ's comments, please contact Mr. David Brymer, Director, Air Quality Division, at 512-239-1725 or david.brymer@tceq.texas.gov.

Sincerely,

Zak Covar
Executive Director

cc: Dayana Medina at medina.dayana@epa.gov.
John Summerhays at Summerhays.john@epa.gov
Larry Wallace at Wallace.larry@epa.gov

Enclosure

COMMENTS BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REGARDING GUIDANCE FOR ONE-HOUR SO_2 NONATTAINMENT AREA SIP SUBMISSIONS

I. Summary

The Texas Commission on Environmental Quality (TCEQ) provides the following comments on the United States Environmental Protection Agency's (EPA) "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" (SO_2 SIP Guidance). The draft guidance was dated October 28, 2013 and made available to states, including Texas, for comment on October 31, 2013. Via teleconference, the EPA announced that the deadline for comments is December 6, 2013.

II. Comments

Section V. C. SO_2 Nonattainment Area Planning Elements – Attainment Demonstration

The EPA should allow the use of alternative modeling approaches for attainment demonstration, or, at a minimum, allow the flexibilities discussed below when AERMOD is used for this purpose. (pages 8 through 11)

Texas has commented previously that alternative modeling approaches should be considered for sulfur dioxide (SO_2) attainment demonstrations, including grid models. The TCEQ encourages the EPA to consider the use of alternative models and approaches to ensure the attainment demonstration process for states with numerous sources or industrial complexes is manageable and yields an accurate scientific representation of the interaction of SO_2 emissions and ambient conditions. The TCEQ is aware of historical approaches and precedents, but the EPA should support innovative approaches and refined techniques based on sound science. The TCEQ believes this support is justified considering the advancement of technology related to models and modeling tools since the 1980s. Additionally, the EPA should support techniques that blend, as applicable, prevention of significant deterioration (PSD) modeling techniques for new source review (NSR) permits with modeling techniques to develop control strategies for nonattainment areas.

Since this draft guidance limits states to using the dispersion modeling system AERMOD in attainment demonstrations, the comments in this section (relating to Section V. C. SO_2 Nonattainment Area Planning Elements – Attainment Demonstration) are directed at how AERMOD could best be utilized in that role. These comments do not constitute an endorsement of the EPA's position that 1) AERMOD must be used exclusively or 2) that modeling is required for designation purposes.

The EPA should clarify the difference that designating an area nonattainment, either through modeling or monitoring, will make on how the attainment demonstration can be conducted. The EPA has emphasized the importance of using accurate (i.e., hourly emission rates, source characterizations, stack parameters, source locations, and building locations) and representative (i.e., temporally varying emissions and emission profiles, meteorological data, and monitored background concentrations) data when performing any modeling analysis[1] for designations. If a nonattainment designation is due to modeling, the EPA has accepted the modeling approach as sufficiently representing the current air quality (baseline) in the analysis area. If the designation is based on monitoring data, then modeling should be performed to sufficiently replicate the current air quality, and the results analyzed to determine an appropriate control strategy to bring the area into attainment.

---

[1] U.S. EPA on the Draft SO2 NAAQS Designations Modeling Technical Assistance Document May 21, 2013.

If the nonattainment status is localized and due to a single source, the TCEQ agrees that a dispersion model like AERMOD could be an appropriate tool to demonstrate attainment of a control strategy. This type of analysis is very similar to the permitting process. However, if many sources are involved in an analysis over a large area and no one source is the cause of nonattainment but many contribute in different locations and various times, a dispersion model like AERMOD may not be the best prediction tool. The EPA should consider other appropriate models, such as CAMx and CMAQ[2], for use in attainment demonstrations especially since the EPA has already found these models acceptable for attainment demonstrations for other pollutants.

The TCEQ disagrees with the requirement to use maximum allowable emissions to determine existing air quality.

An important concept in modeling for attainment demonstrations is evaluating model performance. While this may not be possible in areas with no monitoring, when monitored data is available (including all instances where designations are based on monitoring) it should be a requirement that the modeling results be compared with the monitored data. This comparison must be based on modeling actual emissions from all sources, since using artificially high permitted emission rates would not be representative of actual emissions. The performance evaluation should include hour-by-hour comparisons between modeled and observed concentrations and more importantly a comparison of the modeled and observed distributions of concentrations. Large discrepancies should be addressed first by examining the modeling parameters and if the discrepancies remain, consideration of these discrepancies may be used as weight of evidence (WoE). WoE is discussed extensively in the guidance for ozone, fine particulate matter (PM2.5), and regional haze attainment demonstrations (EPA -454/B-07-002, April 2007).

In the attainment demonstration guidance document referenced above, the EPA implements a relative response factor (RRF)-based approach, which anchors modeled predictions to observed data. Referring to this approach, the EPA states that "problems posed by less than ideal model performance on individual days are reduced by the new procedure." While the ozone, $PM_{2.5}$, and regional haze guidance are written for photochemical grid modeling applications, there is no reason why a similar concept could not be applied to a dispersion model such as AERMOD. The TCEQ modeling staff is available to discuss this approach with the authors of the SO_2 guidance and to offer suggestions for a more workable means of performing a modeled attainment demonstration.

Section V. D. SO_2 Nonattainment Area Planning Elements - Control Strategy (Including RACM/RACT)

Requiring the establishment of site-specific SO_2 emission limits to make creditable any emissions reductions due to federal rules could either reduce or eliminate the compliance flexibility built into these rules and could place an unnecessary burden on states with many sources that might be subject to such federal rules. At a minimum, the EPA should restrict the requirement to have separate enforceable limits to sources within a nonattainment area. (page 16)

The draft guidance acknowledges that the EPA has already promulgated federal regulatory requirements that will yield substantial SO_2 emission reductions including the recently promulgated national emission standards for hazardous air pollutants (NESHAP) for electric generating units (EGU) known as the Mercury and Air Toxics Standards (MATS), the Clean Air Interstate Rule (CAIR), and recently promulgated maximum achievable control technology

[2] CAMx stands for the Comprehensive Air Quality Model with Extensions, developed by Environ, and CMAQ is the EPA's Community Model for Air Quality.

(MACT) for major and area source boilers and commercial and industrial solid waste incinerators. The draft guidance further acknowledges that for facilities subject to MACT and regional transport rules, additional SO_2 controls may not be necessary to demonstrate compliance with the 2010 SO_2 National Ambient Air Quality Standard (NAAQS). However, for State Implementation Plan (SIP) purposes, the guidance indicates that further state action would be required, either by permit or by rule, to establish an enforceable SO_2 emission limit for those sources already subject to these federal rules. Establishment of an independent, federally enforceable SO_2 emission limit for these sources would reduce or eliminate the compliance flexibility built into the rules, as the guidance details for the regional trading programs, MATS, and MACT rules. This approach could put an unnecessary burden on states, such as Texas, with many sources subject to these federal rules.

Rather, the TCEQ continues to support using actual emissions reported to the state, instead of maximum allowable emissions, for the attainment demonstration modeling. Once the current, actual conditions have been modeled and analyzed, the state can then identify necessary control strategies to demonstrate attainment. This process is especially important for sources located outside the nonattainment area that are included in the modeling domain but are located relatively far from the nonattainment area boundary. If the EPA plans to require modeling of maximum allowable emissions and submission of enforceable SO_2 emission limits, those requirements should be limited to identified sources within the nonattainment area.

Requiring Title V Permits to be submitted as SIP revisions to ensure that any SO_2 limits codified therein would become "permanent and enforceable" is inappropriate, unworkable, and not supported by the Federal Clean Air Act (CAA). (page 18)

The EPA asserts in the guidance document that SO_2 emission limits documented in Title V permits, for example, limits chosen by sources to demonstrate compliance with the MATS rule, would be required to be submitted as a SIP revision to make them permanent and enforceable. The TCEQ strongly disagrees with the assertion that Title V permits would need to be submitted as SIP revisions or that it is in any way legal for these permits to be approved as SIP revisions. Title V is a separate and independent part of the CAA and was not intended by the United States Congress to be merged with Title I SIP requirements. Additionally, there is no support for the EPA's assertion that SIP approval of a Title V permit would in any way affect (or overtake) the underlying Title V program obligations adopted by the EPA in 40 Code of Federal Regulations (CFR) Parts 70 and 71 or that states could override their approved Title V Permit programs by submitting individual Title V permits for SIP approval. The TCEQ does not agree that the EPA could fundamentally change Title V requirements and approved Title V programs through this guidance.

The requirements documented in Title V Permits are already federally enforceable and permanent. Title V does not provide authority to establish emission limits. Those emission limits would be established pursuant to authority under Title I –either through NSR or otherwise through §111 or §112. The EPA has not provided any rationale for why existing or future NSR permit limits are inadequate for purposes of maintaining or attaining the NAAQS. NSR, a Title I program, was clearly intended by Congress to assist in attaining and maintaining the NAAQS, yet NSR does not prohibit changes to emission limits, as long as those changes do not interfere with attainment and maintenance of the NAAQS.

The TCEQ questions the necessity of the procedures suggested by the EPA to justify longer averaging time (e.g., 30-day) for emissions limits necessary to model attainment in all cases. The EPA is not considering that the application of reasonable controls may control emissions well below the level necessary for attainment. (page 22)

In the draft guidance, the EPA describes a multi-step process for determining adjusted 30-day averages. This process would require dispersion modeling to calculate the required one-hour emission rate and the use of emissions data from Continuous Emission Monitoring Systems (CEMS) to develop emissions distributions for each source in the nonattainment area or, in some cases, sources outside the nonattainment area that are deemed to have a direct impact on the area. For many areas, there are multiple SO_2 sources that would require this refined AERMOD modeling.

However, the CAA, §172(c)(1) requires states to implement reasonably available control technology (RACT) and reasonably available control measures (RACM) as part of the SIP nonattainment planning process. The EPA appears to be assuming that any enforceable emission limitation will always be at or near the emissions level necessary for attainment. This approach does not consider that the application of a control technology for RACT or RACM purposes may achieve an emissions level far below the level necessary for attainment, due to the inherent characteristics of the technologies, and that the emissions limitation would be based on the emissions level achievable by the control technology. If the application of RACT or RACM results in an emission limit well below the level needed for attainment, even on a 30-day rolling average, the complicated analysis suggested by the EPA should not be necessary to justify the longer averaging time. The TCEQ suggests that the EPA restrict the analysis procedure to justify longer averaging times to situations when the emissions limit is at or near the level necessary for attainment.

Section VIII. E. 4. Redesignation to Attainment of SO_2 Nonattainment Areas - Fully Approved Maintenance Plan - Verification of continued attainment

The EPA should consider in more detail how states should verify continued attainment in maintenance plans that rely on modeling and provide alternatives to the option referenced in the EPA's redesignation guidance, "Procedures for Processing Requests to Redesignate Areas to Attainment." (page 59)

The EPA states that "[t]he air agency's submittal should indicate how it will track the progress of the maintenance plan for the area either through air quality monitoring or modeling." Throughout the discussion of what states should include in their maintenance plans for redesignation to attainment, the EPA references its 1992 guidance "Procedures for Processing Requests to Redesignate Areas to Attainment." This guidance only briefly considers how states could verify continued attainment of the NAAQS where modeling is used to demonstrate maintenance offering an option to reevaluate modeling assumptions and input data every three years.

Because the EPA has chosen an implementation method for the 2010 SO_2 NAAQS that may cause many states to rely on modeling to demonstrate attainment and maintenance, it should consider a more detailed discussion in the guidance of what reevaluation of modeling assumptions and input data means. Further, the EPA should consider alternatives to additional modeling exercises. For example, one option could be allowing states to verify continued attainment of the NAAQS for areas where modeling is used to demonstrate maintenance through their submittal of periodic emissions inventories to the EPA.

The EPA states in the guidance as part of its discussion of contingency requirements for attainment demonstrations, "Since SO_2 control measures are by definition based on what is

directly and quantifiably necessary to attain the SO_2 NAAQS, it would be unlikely for an area to implement the necessary emission controls, yet fail to attain the NAAQS." If the controls necessary to attain the NAAQS have been implemented and will remain in place for the term of the maintenance plan, continued submittal of periodic emissions inventories should be adequate verification of continued attainment.

Appendix A: Guidance on Air Quality Models – Modeling Guidance for Nonattainment Areas

The EPA should clarify how states and other parties should interpret "official guidance" in relation to the modeling process described in the SO_2 SIP Guidance. (page A-2)

The TCEQ understands that the SO_2 SIP Guidance is not binding. Guidance should set limits on what is generally acceptable and not prescribe limits that will hinder innovative approaches. Further, on page A-2, the EPA states that clarifications and interpretations of modeling procedures become official EPA guidance through several courses of action. Only one course, publishing through rulemaking, allows for effective, consistent notice and comment.

The EPA's guidance and policy memoranda have historically been linked to maximum operating conditions and worst-case assumptions in Appendix W. The EPA needs to quickly and officially modify this approach to be compatible with the attainment demonstration process of representing actual conditions rather than theoretical inputs. The policy and guidance memoranda need to address model refinements such as inclusion of chemical transformations and deposition. Without specific guidance on acceptable methods to refine modeling analyses, the development of emission inventories, model input, and refinements becomes time-consuming and burdensome as state agencies guess as to what approaches the EPA may approve.

The EPA should be open to comparable technically-justified approaches. To provide national consistency in application of general guidance, the TCEQ requests that the EPA clarify and provide examples for ambiguous terms used throughout the SO_2 SIP Guidance such as clusters, large source, small source, relatively isolated, small to moderate size urban areas, very buoyant sources, short-term, significant concentration gradient, continuous enough, or frequent enough. The TCEQ understands that use of ambiguous terms gives the state flexibility but believes that examples would assist in providing consistency between EPA Regional Modeling Contacts and other states' analyses.

Model Selection: The EPA and stakeholders have identified significant issues with AERMOD related to permit modeling and the EPA's approach to implementing the 2010 SO_2 NAAQS. (pages A-3 through A-4)

Existing technical issues discussed during the 10th Modeling Conference, the May 31, 2012 SO_2 stakeholder meeting, and the Regional/State/Local Modeling Workshops in 2012 and 2013 relate to topics such as the form of the standard, probability of occurrence of emissions from multiple emission points, varying loads and fuels, downwash, wind speed, transport, background, treatment of dispersion in urban environments, decay (oxidation conversion) of SO_2 in various environments, and model performance. These issues should be resolved prior to finalizing the data requirements rule.

Since the purpose of the SO_2 attainment test is to first characterize existing air quality and then predict future attainment, if AERMOD is used to implement some aspect of the standard, the modeling should establish a base case that replicates a historical episode where possible to prove model performance within statistical standards. The model should be evaluated against known monitoring at a fixed location and time rather than independent of time and location.

The EPA should explicitly allow the use of photochemical grid models for the SO_2 Strategy evaluations and provide a list of all acceptable models.

The TCEQ disagrees that AERMOD is the only suitable model to meet the purpose of the EPA's SO_2 Strategy. The TCEQ notes that the EPA does not identify a preferred model for SO_2 in Appendix W. However, on page A-3 of the SO_2 SIP Guidance, the EPA effectively eliminates the ability of the state to use photochemical grid models, such as CAMx. The EPA states that AERMOD should be used for SO_2 SIP evaluations unless use of an alternative model can be justified, such as the CALPUFF. Since CALPUFF is the preferred model for long-range transport and not near-field dispersion, there does not appear to be any flexibility for an alternative to AERMOD. All recommendations made in Appendix W went through the rulemaking process. The EPA's preference to use AERMOD for analysis of SO_2 has not previously been through the rulemaking process.

The TCEQ notes that guidance for attainment demonstrations, EPA -454/B-07-002, allows states to determine which model is appropriate with input from the EPA. However, if the TCEQ wanted to use CAMx as well as AERMOD to implement the SO_2 Strategy, the EPA requires a justification[3] that includes information well established and familiar to the EPA. The procedure to justify alternative models in Section 3.2 of Appendix W amounts to unnecessary work because states must justify why AERMOD is not appropriate and why the alternative model is superior to AERMOD.

Providing this justification diverts resources from focusing on development of an attainment demonstration. Strictly adhering to the requirements in Appendix W Section 3.2.2 would not give the TCEQ sufficient time to propose an alternative model to AERMOD. If the EPA were to reject demonstration approaches using CAMx, it is probable that the TCEQ could not meet the EPA's planned attainment timeline.

As stated previously, without a final data requirements rule in place, the TCEQ is uncertain as to the best demonstration strategy. Using a grid model that improved meteorological fields and provided additional photochemical (and other) atmospheric reactions could offer a better simulation of existing air quality than AERMOD with AERMET. In addition, the EPA should evaluate AERMOD to determine if technical updates could be made to assess existing air quality for concentrated urban or industrial areas. For these complex situations, options should allow for use of regional scale models. The models could incorporate higher resolution tools, such as Plume-in-Grid sampling grids, if needed.

The TCEQ requests that the EPA provide a list of other models, such as CAMx, which have been used extensively in regulatory assessment, that states can use without being required to submit lengthy justification and model performance studies. Since models like CAMx have been used by many state agencies and the EPA to provide air quality assessments, it would be unnecessary for states to go through the rigor specified in Appendix W Section 3.2.2 (e). In addition, an attainment modeling protocol provides evaluation of model accuracy and bias.

Grid models can better represent variability in surface characteristics that impact the meteorology, variability in meteorological parameters both horizontally and vertically, and spatial and temporal variability of SO_2 concentrations from nearby and distance sources. For example, CAMx could be used with adequate land cover characteristics for the meteorological fields to provide a better representation of existing air quality. In addition, CAMx can also consider both wet deposition and aqueous chemistry. This capability is important in Texas, and many other states, as SO_2 may react more quickly (two hours or less) with moisture (humidity) on cloudy days to form sulfuric acid (H_2SO_4), than the EPA's default AERMOD half-life of four hours in urban areas.

---

[3] 40 CFR 51, Appendix W, Section 3.2 Use of Alternative Models.

In addition to the flexibility to use photochemical models, the EPA should also allow for alternate approaches to identify the sources that should be modeled using refined dispersion modeling. Application of a regional grid model such as CAMx at relatively high resolution (1 to 4 kilometers), combined with conservative assumptions about actual emissions and a threshold concentration inversely proportional to the grid cell area should suffice to identify possible areas of concern. Advantages of this approach include the ability to include additional SO_2 sources, use of Weather Research and Forcasting (WRF) wind fields rather than "straight-line" winds from discrete National Weather Service locations, and accounting for impacts over larger domains than AERMOD can handle. Additionally, using a grid model could provide estimates of background values that should be more representative than those derived from other techniques.

The EPA should provide information, including potential corrections, regarding all technical issues that have been identified with the AERMOD modeling system.

On page A-4, the EPA lists the components of the AERMOD modeling system. The AERMOD modeling system was promulgated in 2005[4]; however, the regulatory system of model and preprocessor computer programs included in Appendix W is AERMOD, AERMAP, and AERMET. The BPIPPRIME program is not in Appendix W so it should be considered non-regulatory as are AERSURFACE and AERSCREEN.

The TCEQ is aware of some technical issues raised by stakeholders related to permit modeling but is not always aware of the EPA's discussions of issues and potential fixes with selected stakeholders or in some venues. Therefore, the TCEQ requests that the EPA provide all technical issues that have been identified by the EPA or any state or local entity to the EPA, associated with each regulatory and non-regulatory portion of the modeling system and how to adjust the modeling process or predicted concentrations due to such issues.

Modeling Framework: The EPA's SO_2 modeling framework for SIP demonstrations should not be identical to NSR or PSD modeling demonstrations. (pages A-5 through A-7)

On pages A-5 through A-7, the procedure and flowchart describing the process to follow for SO_2 SIP modeling demonstrations is inconsistent with established procedures for modeled attainment demonstrations described in EPA -454/B-07-002 (April 2007). In the EPA's demonstrating attainment guidance, the first component to a modeled attainment demonstration is to replicate the current (baseline) nonattainment situation then analyze the data to determine a control strategy to bring the area into attainment with the NAAQS. Once a control strategy has been developed "by reducing emissions from specific source categories rather than through broad "across-the-board" reductions from all sources," the effectiveness of the control strategy is evaluated through modeling the same conditions, except with controlled emissions, to simulate future air quality.

In this guidance, the EPA's use of the term "baseline" includes emissions that are proposed to be controlled through enforceable means, such as in the case of PSD permitting process. To be consistent with the EPA's demonstrating attainment guidance, the EPA should use the term "future case" for this scenario. In this guidance, there is no explanation of how the control strategy was developed for the future case or the basis for the control strategy. In the EPA's demonstrating attainment guidance, the basis for a control strategy is the analysis of the current air quality conditions. The guidance given or referenced is identical to PSD permit modeling approaches, which the EPA acknowledges can be conservative. In addition, the EPA prescribes which model to use, a requirement that significantly limits the amount and type of data that can be used to characterize current air quality in an area.

---

[4] 70 FR 68218.

Modeling Domain: A grid model would provide more representative estimates when the modeling domain exceeds the spatial limits of AERMOD. (page A-7)

For nonattainment areas with adjacent areas with SO_2 sources that span more than 100 kilometers, the spatial limitations of AERMOD are a point of concern. Gridded photochemical models that are capable of modeling on a continental scale would have no such limitation.

Determining Sources to Model: Baseline modeling results should be compared to monitoring data to determine if representative sources have been included. (pages A-8 through A-9)

On pages A-8 through A-9, the EPA describes a complicated, resource-intensive, multi-step process that could cause or contribute to a NAAQS violation. The TCEQ does not agree with this approach. If modeling results substantially agree with monitored data, adequately replicating the baseline nonattainment condition, then the inclusion of the sources modeled is sufficient. Comparison of modeling result to monitored data is consistent with EPA attainment demonstration guidance (EPA -454/B-07-002, April 2007). Contributions from non-modeled sources can be included in the background concentrations and not explicitly modeled using AERMOD. Again, a grid model could be used to estimate background concentrations and certain concentration gradients.

The EPA should clearly state criteria that can be used to refine transport times of emissions within the modeling domain.

Gaussian models, such as AERMOD, assume constant emissions to allow for steady state analysis, negligible dispersion downwind, non-reactive pollutants, homogeneous meteorological conditions over the modeled domain, and wind speed that is constant in time and in elevation. Transport time is of particular interest. Transport time from a source to a receptor could be greater than one hour at distances less than 50 kilometers (km) or ~31 miles given a wind speed less than ~31 miles per hour (mph) for a specific hour. A typical maximum wind speed would be about 15 mph (25 km per hour). The EPA should clearly state in the guidance that it is appropriate to refine model results if the modeled results do not represent actual conditions.

Receptor Grid: The EPA should define and provide examples for ambiguous terms related to receptor placement. (Pages A-9 through A-10)

On page A-9, the EPA states that receptor placement should be of sufficient density to provide resolution needed to detect significant gradients in the concentrations, with receptors placed closer together near the source to detect local gradients and placed farther apart away from the source. The TCEQ suggests that the EPA define and provide examples for ambiguous terms such as significant concentration gradient, local concentration gradient, closer together, farther apart, and ambient boundary to ensure all EPA Regional Modeling Contacts provide consistent guidance.

The TCEQ disagrees with the EPA's fence-line approach.

On page A-9, the EPA suggests that the user place receptors at key locations such as around facility fence lines, which the EPA suggests define the ambient air boundary for a particular source or monitor location for comparison to monitored concentrations for model evaluation purposes. Ambient air is defined by rule and is used in PSD modeling demonstrations and ambient air monitoring.[5] This SO_2 SIP Guidance is for SIP demonstrations, not for a PSD permit application or the location of a regulatory monitor. For example, it is not realistic to place receptors over bodies of water, over unfenced plant property, on buildings, or over roadways

[5] 40 CFR 50.1 (e).

when you could not place a monitor at the same locations to determine concentrations to compare to the NAAQS.

The EPA should clearly indicate that the state should determine the adequacy of receptor placement.

The EPA's receptor placement approach seems to replicate PSD permitting requirements. Though the permitting program and SIP development process both require demonstrations regarding attainment status, the scope, purpose, and process for each differ. Regarding scope, the permitting program is applied on a project (source) basis and utilizes a background concentration to account for other sources in an area. A SIP considers all sources and location of ambient air monitors in an area. In both instances, the appropriate location of receptors would be case-specific.

The purpose of the permitting program is to demonstrate compliance based on a reasonable worst-case set of conditions. A SIP analysis must replicate the nonattainment problem. For SIPs, the process is to analyze the situation based on actual emissions and monitored concentrations, identify culpable sources, develop a control strategy to reduce emissions, and then demonstrate attainment through modeling. The focus of modeling results is at monitor locations.

Therefore, the EPA should clearly indicate that the state should determine the adequacy of receptor placement.

Source Inputs: The TCEQ disagrees with the approach to use maximum allowable emissions to determine existing air quality (baseline). (pages A-10 through A-14)

The draft guidance calls for the use of maximum allowable emissions to determine/replicate baseline conditions. Such an approach is identical to PSD permit modeling, which the EPA acknowledges can be conservative, but not representative of or appropriate for replicating baseline conditions. In the EPA's demonstrating attainment guidance (EPA -454/B-07-002, April 2007), the first component to a modeled attainment demonstration is to replicate the current (baseline) nonattainment situation then analyze the data to determine a control strategy to bring the area into attainment with the NAAQS. Once a control strategy has been developed, which would include limits due to state and federal rules, the effectiveness of the control strategy would be evaluated through modeling the same conditions, except with controlled emissions, to simulate future air quality. Given better understanding of atmospheric processes and advances in monitoring and modeling technologies in the past 20 to 30 years, the TCEQ believes that the EPA's 2007 guidance on modeling attainment demonstrations is more appropriate than the 1994 guidance.

The EPA should reconsider the version of AERMOD for use with its stack height proposal.

On pages A-12 through A-13, the EPA discusses good engineering practice (GEP) stack height rule limits, the BPIPPRIME program, and downwash. However, stakeholders have raised significant concerns related to the EPA's modification of AERMOD related to permit modeling that changed how the model calculates downwash effects. The EPA should remove the change from the regulatory version of AERMOD until independent peer review, consequence analyses, and evaluations are conducted for stacks above rule height limits. In addition, these evaluations should be conducted concurrently with an independent review and evaluation of the effective length parameter in the BPIPPRIME program that is used to develop the downwash input for AERMOD.

The EPA should not preclude the use of grid models simply because these models do not consider downwash.

The TCEQ suggests that it is inappropriate to consider downwash without first evaluating a model's performance particularly if the model is used to simulate concentrations at an ambient air monitor. Once acceptable model performance is established, downwash effects can be appropriately considered for modeling based on actual or allowable emissions. This evaluation would apply to both dispersion and grid models.

The EPA should not preclude the use of grid models simply because these models do not directly consider downwash. The TCEQ notes that neither GEP stack height rules nor downwash of major stationary source apply to photochemical grid models when evaluating ozone, in either performance evaluations or control strategy development. Until the EPA conducts independent peer review, consequence analyses, and evaluations that demonstrate a model's capability to accurately represent downwash effects, the EPA should allow the use of grid models as the states deem appropriate. In addition, the EPA should provide Regional Modeling Contacts with reasonable guidelines related to the inclusion of downwash in AERMOD for any sources in the modeling domain.

Urban/Rural Determination: The EPA should allow the use of other models to determine boundary layer characteristics and the method to address chemical transformation and deposition. (pages A-14 through A-17)

The urban/rural techniques presented in Appendix A, page A-14 appear to be outdated. Recent, actual land cover and land use data that is used as input to all of the prognostic meteorological models and biogenic emissions models would provide more accurate estimation of the stability and boundary layer definition. Page A-15 of Appendix A addresses the use of a half-life of SO_2 in urban areas. There is still debate whether this occurs in rural areas as well and in all high humidity areas. A photochemical model using improved meteorological fields and with chemistry invoked would address all of these issues.

The TCEQ would like the flexibility to propose grid models, such as CAMx, which can better represent spatial variability of urbanization and handle the complex chemical transformations that could occur in urban and rural areas.

On pages A-14 through A-17, the EPA discusses the need to characterize the area around a source as urban or rural to determine the applicable boundary layer characteristics that affect the model's prediction of downwind concentrations. The EPA discusses various methods to determine boundary layer characteristics for use with AERMOD related to permit modeling. The referenced methods (Auer Land Use, Population Density, and AERSURFACE) will not yield exactly the same results. The EPA should discuss how the results from any of these methods can provide reasonably representative boundary layer characteristics as each method relies on different information, such as United States Geological Survey quad (Auer Land Use) or 1992 National Land Cover Database (NLCD) (AERSURFACE), and population data.

The EPA should update the guidance on use of the half-life default and wet and dry deposition in AERMOD. The EPA should also allow the use of other models to address chemical transformation and deposition.

On pages A-14 through A-17, the EPA discusses the need to characterize the area around a source as urban or rural to determine the effect of chemical transformations on the model's prediction of downwind concentrations. The EPA states that this characterization is important

because AERMOD invokes a four-hour half-life for urban SO_2 sources and assumes that chemical transformation is unimportant in rural areas over short time periods.[6]

The regulatory option to use a single half-life value in AERMOD and only in urban areas is based on a paper published in 1964.[7] While assumptions that transformation in rural areas over a few hours is unimportant and urban area transformations can be based on a single exponential decay factor and account for the effects of temperature, light intensity, humidity, interaction with other pollutants, and wet and dry deposition may be appropriate for permit modeling , they may be overly conservative for the purpose of characterizing existing air quality, particularly given the level of the one-hour standard.

For example, while the EPA considers SO_2 transformation in rural areas unimportant, the TCEQ notes there are nitrogen oxide (NO_X) sources, such as power plants, located in rural areas and that SO_2 can be catalytically oxidized to SO_3 (in the formation process of sulfates) in the presence of NO_X.[8] More recent papers make the argument that SO_2 reacts more quickly (two hours or less) with moisture (humidity) on cloudy days to form H_2SO_4, than the EPA's default AERMOD half-life. Both wet deposition and aqueous chemistry are available in photochemical grid models, such as CAMx, but not in AERMOD.

In addition, this guidance does not address removal of SO_2 by deposition. Though AERMOD can account for wet and dry deposition, there is no specific guidance on how this capability can be implemented for removal of SO_2. Not accounting for any removal of SO_2 during transport could provide unrealistically high predicted concentrations of existing air quality. Therefore, the TCEQ requests that the EPA provide guidance on how to implement wet and dry deposition algorithms in regards to SO_2 removal.

Meteorological Data: The EPA should provide examples of representativeness. (pages A-17 through A-21)

On pages A-17 through A-19, the EPA discusses surface characteristics and representativeness. The EPA emphasizes the importance of using representative data when conducting dispersion modeling. It would be helpful if the EPA would define criteria as to what determines "representativeness" when determining existing air quality. The TCEQ requests that the EPA clarify its expectation of what is representative or appropriate to accomplish the purpose of the SO_2 SIP demonstration. Without a clear understanding of the meaning of representative, there does not appear to be much difference between using a screening technique or refined model since there could be a high degree of uncertainty in the model input data. Though modeling can produce results over a large domain, this does not address the validity of the predicted concentrations within the domain.

Background Concentrations: The TCEQ suggests that the EPA specifically allow a modeled background concentration using a regional scale model such as CAMx to estimate hourly background concentrations when determining existing air quality. (A-21 through A-23)

On pages A-21 through A-23, the EPA discusses the use of monitored concentrations to estimate impacts from background sources. The EPA describes the difficulties of developing representative one-hour background concentrations of SO_2 when there are a limited number of monitors representative of the air quality for the attainment demonstration particularly when an area is designated nonattainment through monitoring. The EPA calls for states to use professional judgment when delineating the impact of sources with proposed emission

---

[6] 40 CFR 51 (Appendix W), 2005, Section 7.2.6 Chemical Transformation.
[7] Turner, D.B., 1964, A Diffusion Model for an Urban Area, Journal of Applied Meteorology, 3(1): 83–91.
[8] Optimum Site Exposure Criteria For SO_2 Monitoring, EPA-450/3-77-013, April 1977.

reductions due to a control strategy, nearby sources that are not included in the control strategy, and other sources, which could be distant sources outside the nonattainment area, in order to develop a background concentration. Once an hour-by-hour background concentration is developed for a monitor, excluding periods when dominant sources are influencing the monitored concentration, the EPA recommends using average values to develop a background value at each receptor in the modeling domain. The methodology described in the guidance is highly subjective as the terms "nearby," "distant," "dominant," and "other" are not defined and open to interpretation.

In order to develop more objective and technically defensible background concentrations, the TCEQ suggests that hourly concentrations from a regional scale model, such as CAMx, may be used for background concentrations both temporally and spatially. When using the procedure outlined in EPA's demonstrating attainment guidance (EPA -454/B-07-002, April 2007), if the baseline modeling has adequately replicated the nonattainment situation through comparison with monitoring data, then all relevant sources have been sufficiently captured, whether they are termed nearby, distant, dominant, or other. When the impact of the control strategy is represented in the attainment modeling (future case), model predicted concentrations should be representative of the future case. Using a grid model could provide estimates of background values that may be more representative than those derived from distant monitors or other techniques.

Supplemental Comment: The TCEQ suggests that ambient monitoring data be used early in the demonstration process to evaluate model performance consistent with the process outlined in EPA -454/B-07-002. (page A-28)

In the EPA's demonstrating attainment guidance (EPA -454/B-07-002, April 2007), the first component to a modeled attainment demonstration is to replicate the current (baseline) nonattainment situation then analyze the data to determine a control strategy to bring the area into attainment with the NAAQS. To determine that the baseline condition has been adequately replicated, modeling results are compared to ambient monitor results in time and space. Once this analysis is complete, culpable sources can be identified and appropriate emission control strategies developed to bring the area into attainment. Modeling the same conditions considering the controlled emissions is the attainment test.

Even for PSD modeling, pre-construction monitoring provides an air quality baseline prior to any changes at a site.