TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 31, 2013

U.S. Environmental Protection Agency
Mr. George Bridgers
Air Quality Modeling Group
Bridgers.George@EPA.gov

Re: TCEQ Comments on EPA's "Draft Guidance for $PM_{2.5}$ Permit Modeling"

Dear Mr. Bridgers:

The Texas Commission on Environmental Quality (TCEQ) appreciates the opportunity to respond to the U.S. Environmental Protection Agency's (EPA) draft guidance entitled: "Draft Guidance for $PM_{2.5}$ Permit Modeling," Publication No. EPA 454/D-13-001. This draft guidance was posted on EPA's website on March 4, 2013.

Enclosed, please find the TCEQ's detailed comments relating to the draft guidance referenced above. If you have any questions concerning the enclosed comments, please contact Mr. Michael Wilson, P.E., Director, Air Permits Division, Office of Air, (512) 239-1922, or at mike.wilson@tceq.texas.gov.

Sincerely,

Zak Covar
Executive Director

Enclosure

Texas Commission on Environmental Quality (TCEQ) Comments to the U.S. EPA on the Draft Guidance for $PM_{2.5}$ Permit Modeling

Publication No. EPA 454/D-13-001, March 4, 2013

The U.S. Environmental Protection Agency (EPA) posted draft non-binding guidance for $PM_{2.5}$ permit modeling on EPA's Air Quality Modeling Group website on March 4, 2013. This guidance contains EPA's preliminary recommendations for how a stationary source seeking a Prevention of Significant Deterioration (PSD) permit may demonstrate that it will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) and PSD increments for $PM_{2.5}$. TCEQ's comments are organized with headings that correspond to the major section titles used in EPA's draft guidance document.

I. General Comments

TCEQ acknowledges that since its promulgation in 1997, implementing the $PM_{2.5}$ NAAQS into new source review (NSR) permitting programs nationwide continues to be a significant technical challenge for permitting authorities. TCEQ welcomes any progress related to $PM_{2.5}$ implementation, and requests that EPA provide the flexibility needed for permit authorities to evaluate or conduct required compliance demonstrations. Additionally, TCEQ urges EPA to identify relevant criteria, and the weight to place on them, that permitting authorities must use to conduct these reviews.

Significant technical challenges exist and technical tools are not available.

When EPA adopted the $PM_{2.5}$ standards in 1997, it recognized the great technical challenges that permitting authorities faced to implement this pollutant into NSR permitting programs.[1] EPA still does not have the necessary technical tools to quantify $PM_{2.5}$ emissions or predict ambient air concentrations due to interactions of $PM_{2.5}$ precursors so that stationary sources and permitting authorities can adequately meet NSR permitting requirements for $PM_{2.5}$.[2]

Apparent progress was made in 2007 as EPA proposed to add significant impact levels (SILs) for $PM_{2.5}$ to the PSD regulations at 40 CFR §§51.166 and 52.21. The SILs are streamlining tools used to determine if a source would cause or contribute to a NAAQS violation or exceedances of an increment. Additionally, the SILs were based on direct $PM_{2.5}$ emissions because state-of-the-art modeling tools would not be available to

[1] October 23, 1997 Memorandum, Interim Implementation of New Source Review Requirements for PM2.5, John S. Seitz, Director Office of Air Quality Planning & Standards.
[2] 78 Fed.Reg. 3259. National Ambient Air Quality Standards for Particulate Matter, January 15, 2013.

adequately account for secondary $PM_{2.5}$ impacts resulting from emissions of precursors of $PM_{2.5}$.[3]

In the proposed rule, the required compliance demonstrations and air quality analyses for the $PM_{2.5}$ NAAQS and PSD increments were limited to direct $PM_{2.5}$ emissions. However, EPA removed the requirement to consider only directly-emitted $PM_{2.5}$ when it finally adopted the rule in 2010.[4] EPA's rationale for removing consideration of direct $PM_{2.5}$ relied upon existing PSD rules that defined precursors of $PM_{2.5}$. Because EPA significantly changed the proposed language without adequate notice, TCEQ requested that EPA reconsider this action. EPA granted that petition in December 2010 and indicated at the April 2013 Regional, State, and Local Modelers' Workshop (RSL Workshop), that rulemaking is underway to address the petition and other outstanding issues.

EPA should not rely on interim policy and guidance without a complete national framework adopted through rulemaking.

Without a complete and clearly understood national framework to implement $PM_{2.5}$ into the NSR PSD permitting program, EPA's proposed estimating techniques may result in more uncertainty and significantly increase permit review and issuance time.[5]

For example, in the section of the October 2010 adoption preamble that discusses $PM_{2.5}$ precursors and the SILs, EPA reiterated that it lacks necessary technical tools to conduct required compliance demonstrations resulting from both direct and precursor emissions and stated it was more effective to rely on interim policy and guidance to help determine the best methods available to assess source impacts on ambient $PM_{2.5}$.[6] In contrast, in the section of the same preamble that discusses $PM_{2.5}$ increment and the SILs, EPA stated it has provided approved models and guidelines to use to conduct the increment analysis.[7] However, the current *Guideline on Air Quality Models* (40 CFR part 51 appendix W) does not address how to include $PM_{2.5}$ precursor emissions in either the NAAQS or PSD increment analysis.

Now, three years later, key NSR permit streamlining tools adopted in 2010 ($PM_{2.5}$ SILs and Significant Monitoring Concentration) have been vacated by the D.C. Circuit Court; technical tools needed to complete a comprehensive analysis of all emissions that contribute to ambient concentrations of $PM_{2.5}$ remain in development; and, rulemaking to update the *Guideline on Air Quality Models* is not anticipated until 2015.

In the draft publication and March 2013 Webinar, EPA also made clear that the guidance for $PM_{2.5}$ modeling is not binding or regulatory and did not require a formal

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[3] 72 Fed.Reg. 54115, 54149. Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers ($PM_{2.5}$)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC), September 21, 2007.

[4] 75 Fed.Reg. 64886. Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers ($PM_{2.5}$)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC), October 20, 2010.

[5] 78 Fed.Reg. 3252-3263. National Ambient Air Quality Standards for Particulate Matter, January 15, 2013.

[6] *Id.* 64886.

[7] *Id.* 64869.

response to comments.[8] However, because significant technical challenges still remain for $PM_{2.5}$, TCEQ encourages EPA to reach out to all stakeholders in a timely and effective manner to ensure all points of view are considered in order to reach a national consensus and consistency among federal, state, and local permitting programs. To illustrate this point, TCEQ asserts that EPA missed an opportunity by not allotting more than a few hours to discuss $PM_{2.5}$ modeling issues at the 2013 RSL Workshop, held April 22nd through April 25th.

After EPA has fully vetted the modeling guidance and developed a final draft, TCEQ would expect another opportunity to comment on the document.

II. Guidance Overview

EPA's reliance on a case-by-case approach is unnecessarily confusing and inefficient, resulting in an inconsistent national implementation.

EPA states that applicants and the permit reviewing authority,[9] in consultation with the Regional Office, can use existing models to develop an acceptable approach for a compliance demonstration on a case-by-case basis. However, the hybrid approaches suggested in the draft guidance appear counter to achieving any national consistency or uniformity in the application of air quality models. Therefore, to maintain national consistency and to allow others to "replicate" the compliance demonstration, EPA should provide a list of elements that should always be addressed for the conceptual description and protocol.

EPA does not provide detailed guidance as to the scope required for the applicant's modeling protocol or EPA's expectations for review by a permitting issuing authority. Applicants must have some idea of what is expected of them in order to prepare an effective modeling protocol. Also, permit issuing authorities must have clearly identified criteria that they are required to evaluate, in addition to areas of concern that would require further analysis. The lack of clear and consistent guidance and expectations will lengthen the time needed to review and issue permits. For example, EPA states that each compliance demonstration will be unique and may require the applicant to consider multiple factors and thoroughly justify assumptions as a part of qualitative assessment but does not provide examples that address all factors and cases.

Another example relates to EPA guidance for qualitative assessments. EPA's approach requires that the applicant expend considerable effort to develop a conceptual description (or model) for the area of interest and conduct a pre-protocol analysis similar to the effort proposed for State Implementation Plan (SIP) determinations. The EPA advises that more detailed information on the development of conceptual descriptions is contained in the North American Research Strategy for Tropospheric

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[8] Disclaimers 1, 3, Slides 9, 11, EPA Draft Guidance for PM2.5 Permit Modeling March 13, 2013 – Webinar.

[9] TCEQ regards references to *permit reviewing authority* to mean a state with delegated authority rather than a SIP approved state with *permit issuing authority*.

Ozone (NARSTO) reference document.[10] However, EPA does not discuss whether the example descriptions are adequate; and, TCEQ notes the lack of a conceptual description for Texas is a complicating factor for Texas applicants. In addition, TCEQ notes that the guidance on conceptual descriptions contained in the other recommended EPA reference document[11] was developed for SIP attainment demonstrations. The reference only contains information related to annual $PM_{2.5}$. EPA should include a 24-hour example in addition to the annual $PM_{2.5}$ example in this draft guidance document, and tailor the guidance specifically for NAAQS and PSD increment demonstrations.

EPA should provide detailed guidance and examples related to hybrid qualitative and quantitative analyses.

EPA has acknowledged that there is no preferred model to assess the impact of a single source for both direct and secondary $PM_{2.5}$ concentrations. While EPA identifies a preferred model to evaluate direct $PM_{2.5}$ emissions, it stops short of providing specific criteria for issuing authorities and applicants to evaluate, consider, and select a photochemical model for use in the PSD permitting program. Assembling the protocols and input data for a model is a resource-intensive task. Given the complexity of the chemistry of formation, transport dynamics and the specialization of the tools available, detailed guidance on the application of the tools is mandatory to avoid spurious results or trivial gain at great expense.

The draft guidance is vague about what circumstances would merit quantitative photochemical grid modeling and how to blend dispersion modeling (AERMOD) results with results from a photochemical grid model. Rather, the guidance should provide concrete examples of such circumstances in order to help applicants and permit issuing authorities decide when qualitative, hybrid qualitative and quantitative, or quantitative approaches should be used for Case 3 and 4 assessments.

For example, it is unlikely that an applicant would gather the extensive information needed to set up, evaluate model performance, and run a photochemical grid model specifically for a single permit application. If available, applicants could use existing modeling and include the proposed project to determine the project's impact. However, there may be additional steps the applicant should take such as running the model without the project to compare the applicant's modeled results with previous modeled results. The guidance could discuss this point as well as offer assistance by listing some available model and their relative strengths and limitations.

EPA Regional Offices should give applicants and permit authorities clear, consistent, and timely guidance.

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[10] EPA refers to more detailed information on the development of conceptual descriptions for an area, in Chapter 10 of "Particulate Matter Assessment for Policy Makers: A NARSTO Assessment." P. McMurry, M. Shepherd, and J. Vickery, eds. Cambridge University Press, Cambridge, England (NARSTO, 2004).

[11] Section 11, "How Do I Get Started? A Conceptual Description" in "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze." U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (U.S. EPA, 2007a).

Given the complex technical issues related to $PM_{2.5}$ NAAQS and PSD increment demonstrations, EPA strongly encourages early consultation with its Regional Offices and TCEQ agrees. Early consultations between the permit issuing authority, EPA Regional Office, and the applicant to address the technical complexities associated with the evaluation of $PM_{2.5}$ concentrations will benefit all parties. Recommendations by Regional Offices regarding applicant protocols must be timely, clear, and offer reasonable approaches to conduct the required analyses. In addition to the process to develop an acceptable protocol, TCEQ recommends that participation, recommendations, and guidance provided by the Regional Office be documented as part of the existing consultation process and provided to the applicant and permit-issuing authority for the permitting record.

In addition, because of permit review and issuance time frame requirements, it should be understood that if the Regional Office does not respond in a timely manner, the permitting process will move forward with comments to the applicant from the permit issuing authority.

EPA should consider revising precursor significant emission rates (SERs).

The SER is an important screening tool because once a source is major for one pollutant an increase in a precursor pollutant's emissions above the SER requires a $PM_{2.5}$ compliance demonstration. Increasing the precursor SERs would streamline the source impact analysis.

Based on the National Association of Clean Air Agencies (NACAA) Workgroup report,[12] referenced by EPA in the guidance, the current SERs are too low and TCEQ requests that EPA consider conducting an evaluation to support increasing the SERs for NO_x and SO_2 from 40 tons per year (tpy) to 1000 and 400 tpy, respectively.

III. Significant Impact Analysis

Assessing Primary $PM_{2.5}$ Impacts

EPA should no longer base dispersion model performance solely on the model's ability to predict a maximum value anywhere in the modeling domain.

Since EPA proposed the blending of dispersion and photochemical grid model results, it would make sense that the model performance metrics be similar. The performance of a model is highly dependent on the setting options and input data selections. The selections are case specific and can be validated through comparison with actual data. To state that certain selections are generally irrelevant for one model, like AERMOD, but are crucial to another model, like CAMx, without case specific data, is contradictory. If model setting options and input data selections can be justified with real monitoring

[12] PM2.5 Modeling Implementation for Projects Subject to National Ambient Air Quality Demonstration Requirements Pursuant to New Source Review. Report from NACAA $PM_{2.5}$ Modeling Implementation Workgroup dated January 7, 2011. Appendix C .

data (weight of the evidence) for one model then that option should be made available for use with all models.

EPA states that the purpose of recommending a preferred model is to ensure that the best-performing model is used. However, TCEQ disagrees with the protocol EPA has historically used to determine model performance for a dispersion model. The protocol states that when comparing modeled-to-monitored concentrations the time and location of the concentrations, as well as the meteorological conditions that existed at the time and location, are of minor concern.

In addition, TCEQ disagrees with EPA's assessment as noted in the March 23, 2010, $PM_{2.5}$ guidance memo,[13] that dry and wet deposition can reasonably be ignored because 1) these factors are expected to be minor for $PM_{2.5}$ due to the small particle size, and 2) there may be additional uncertainty associated with deposition modeling for $PM_{2.5}$ due to the fact that deposition properties may vary depending on the constituent elements of $PM_{2.5}$. Since the $PM_{2.5}$ standards, SILs, and baseline area concentration were lowered, small changes in predicted concentrations are extremely important. TCEQ wants to avoid having to devote time and resources trying to evaluate small differences in concentration. This concern is increased when applying qualitative approaches to justify that estimated impacts would not be adverse.

Historically, the worst-case approach for dispersion models provided EPA with a margin of safety in the modeling demonstration. However, TCEQ disagrees with the continued use of the approach considering current technical challenges, lower standards, statistical design values, and the need to determine when a project would contribute to a NAAQS violation or increment exceedances. TCEQ suggests that dispersion model performance should consider predicted concentrations with regard to time and location[14] given the spatial and temporal variability of pollutant emissions, meteorology, chemical interactions, transport, and deposition.

The TCEQ notes that EPA does not follow the dispersion model approach for photochemical models. In *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze* (EPA -454/B-07-002, April 2007), model performance evaluation "*is comprised principally of statistical assessments of model versus observed pairs. Operational evaluations are generally accompanied by graphical and other qualitative descriptions of the model's ability to replicate historical air quality patterns.*" Considering this type of evaluation, "*if we are able to correctly characterize changes in concentrations accompanying a variety of meteorological conditions, this gives us some confidence that we can correctly characterize future concentrations under similar conditions.*"

EPA should allow permitting authorities the option to use photochemical grid models to estimate direct $PM_{2.5}$ emissions.

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[13] Stephen Page Memorandum, March 23, 2010, Modeling Procedures for Demonstrating Compliance with the $PM_{2.5}$ NAAQS, Page 10 http://www.epa.gov/region07/air/nsr/nsrmemos/pm25memo.pdf

[14] Primary $PM_{2.5}$ impacts typically occur close to the emission source, separate from secondary PM2.5 impacts, which require time to form and occur much farther away from the source.

While EPA recommends AERMOD as the preferred model to be used to model direct $PM_{2.5}$ emissions, TCEQ contends that photochemical grid models are quite capable of modeling non-reactive sources of primary $PM_{2.5}$. Requiring the use of AERMOD for direct $PM_{2.5}$ unnecessarily complicates the review process and determination if the project's precursor emissions are significant. TCEQ proposes that EPA allow the option to use photochemical grid models to simulate both direct and secondary $PM_{2.5}$ instead of running AERMOD separately for primary $PM_{2.5}$ when justified.

Hybrid Qualitative and Quantitative Assessment

EPA does not suggest using 100 percent conversion of SO_2 and NO_x to $PM_{2.5}$ to account for secondary formation.

To prevent misinterpretation of the guidance, EPA should not appear to reject any streamlining method that can be technically justified. EPA agreed with the NACAA Workgroup's rejection of the use of AERMOD with 100 percent conversion of SO_2 and NO_x concentrations to $(NH_4)_2SO_4$ and $(NH_4)NO_3$ because "*this approach produced excessively high modeled concentrations compared to other methods.*"[15] EPA should explicitly allow any estimation method that provides conservative results and demonstrates compliance with the NAAQS.

Sub-grid Plume Treatment in Photochemical Grid Models

EPA lists the elements that should be included in a modeling protocol when a photochemical grid model is proposed, but does not describe in detail what these elements entail.

TCEQ understands that this draft guidance document is not meant to prescribe how a photochemical modeling demonstration should be applied; however, EPA needs to provide both its expectations of permitting authorities and concrete examples elaborating those expectations through listing factors and their relative weighting necessary for consideration by issuing authorities in making these evaluation determinations.

TCEQ believes that guidance for photochemical modeling as it relates to PSD permitting is needed, particularly if some of the suggested methods for evaluating $PM_{2.5}$ secondary impacts rely on blending photochemical and dispersion modeling results. For example, should the episode time frame (1 year, 3 years, 5 years, or some other period) for the photochemical modeling of $PM_{2.5}$ precursors coincide with the time frame of the meteorological input data used with AERMOD for direct $PM_{2.5}$ assessment?

Comparison to the SIL

TCEQ agrees that SILs should be used to streamline compliance demonstrations and to determine if a proposed source's impact contributes to a NAAQS violation.

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[15] $PM_{2.5}$ Modeling Implementation for Projects Subject to National Ambient Air Quality Demonstration Requirements Pursuant to New Source Review. Report from NACAA $PM_{2.5}$ Modeling Implementation Workgroup dated January 7, 2011. Appendix E.

While TCEQ supports the use of $PM_{2.5}$ SILs, TCEQ urges EPA to provide concrete examples for the comparison process for each of the four suggested case assessments to ensure states compare impacts consistently. TCEQ agrees with the NACAA assessment that peak impacts due to a source's primary and secondary $PM_{2.5}$ emissions are not likely to be well-correlated at a specific location or time, and that these relationships may vary for different precursors.[16] In addition, TCEQ continues to be concerned about the process to compare impacts from direct and secondary emissions without a single-source model that pairs impacts temporally for each significant receptor in the modeling domain.

EPA's guidance on qualitative assessment of $PM_{2.5}$ concentrations is confusing and incomplete.

EPA states that a qualitative assessment of secondary $PM_{2.5}$ concentrations may be used entirely or to supplement quantitative modeling results to compare to the applicable SIL, but goes on to state that such an assessment would be difficult to do because the SIL represents a specific numerical value. TCEQ requests that EPA develop more detailed examples outlining its expectations for how qualitative analyses would be conducted to determine significant impact. If a SIL will not be used, EPA should explain how an applicant would demonstrate that a project's proposed emissions will not contribute to a violation of the NAAQS.

IV. Cumulative Impact Analysis

Modeling Inventory

The EPA should lead the effort to develop updated emission factors.

TCEQ agrees with the NACAA Workgroup assessment of $PM_{2.5}$ emission factors in EPA's AP-42.[17] The gap for existing $PM_{2.5}$ emission factors for non-combustion and fugitive sources and the overall quality of nearly all $PM_{2.5}$ emission factors is a significant concern. These technical limitations are not new and EPA should lead the effort to develop a new set of emission factors.

EPA should clearly state the appropriate emission rate and averaging time to be used to model direct $PM_{2.5}$ and its precursors for NAAQS analyses.

Long-standing EPA guidance[18] as well as Table 8-2 in Appendix W, support the idea that the demonstration of compliance must be appropriate (indicator and averaging time) for the NAAQS in question.

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[16] *Id.* Page 2 and Section 2 $PM_{2.5}$ Secondary Formation from Project Sources.

[17] *Id.* Section 1 Developing Emissions Inventories for Permit Modeling.

[18] (Review of State Implementation Plans and Revisions for Enforceability and Legal Sufficiency, from Michael S. Alushin, Alan W. Eckert, John S. Seitz, September 23, 1987, Guidance an Enforceability Requirements for Limiting Potential to Emit through SIP and §112 Rules and General Permits, Kathie A. Stein, Director, January 25, 1995, and Proposed Short Term Limits Policy, Richard R. Long, Director, Air and Radiation Program, EPA Region 8, September 22, 1998).

EPA's statement on the appropriate emission rate to be modeled needs to include the clarifying clause "*appropriate for the NAAQS review.*" In the context of the guidance in this section, the review is for the $PM_{2.5}$ 24-hour and annual NAAQS. As such, the rates appropriate to demonstrate compliance with these NAAQS are the maximum allowable 24-hour and annual rates, for both direct $PM_{2.5}$ and its precursors.

In addition, it would be helpful if EPA discussed how to address emission rates from intermittent activities such as maintenance, startup, and shutdown, and how those sources should be used in a photochemical model. For example, should only *major* sources of $PM_{2.5}$, SO_2, and NO_x in the modeling domain be modeled at permitted emission rates when using AERMOD? Should all sources of $PM_{2.5}$, SO_2, and NO_x in the modeling domain be modeled with actual emission rates when using a photochemical model? Should volatile organic compounds (VOC) and ammonia emissions be included when using a photochemical model when those pollutants are not assumed to be precursors?

Monitored Background

TCEQ agrees that existing monitoring data can be used to meet the requirements in 40 Code of Federal Regulations (CFR) §§ 51.166(m) and 52.21(m).

TCEQ agrees that PSD permit applicants may continue to meet the preapplication analysis and preconstruction monitoring requirement by using data from an existing monitoring network that are determined by the permitting authority to be representative estimates of background conditions in the affected area. The TCEQ suggests that conservative values could also be used to meet the preconstruction monitoring requirement; e.g. monitored concentrations higher than would be expected in the affected area.

Comparison to NAAQS

EPA recommends a new First Tier that allows the modeled design value to be added to a monitored design value.

TCEQ agrees with the new first tier recommendation. Adding a modeled design value (based on the multi-year average of the 98th percentile of 24-hour values) to the monitored design value from a representative or conservative monitor, should adequately assess direct and secondary $PM_{2.5}$ impacts from the project sources.

EPA should clarify and provide examples of how to perform cumulative NAAQS analyses using qualitative, hybrid, and full quantitative approaches.

EPA should provide more detailed examples to describe how modeled impacts from direct $PM_{2.5}$ and $PM_{2.5}$ precursors should be determined.

- Meteorology. The guidance does not address the time period to be used for evaluating photochemical modeling performance. As a result, it is not clear which, if any, meteorological data standard (5 years of National Weather Service data, 3 years of prognostic model data, or 1 year of site specific data) applies to the use of photochemical models. It is also unclear whether the meteorological

time period for dispersion modeling should be coincident with the meteorological time period for photochemical modeling.

- Qualitative Cumulative Analysis. EPA should clarify that a qualitative analysis will be allowed for Case 3, and should provide multiple examples of how to conduct a qualitative comparison to the NAAQS. EPA suggests throughout the guidance that few analyses would require explicit photochemical modeling of secondary $PM_{2.5}$. However, in this section of the guidance, EPA implies the cumulative impact is purely quantitative. Based on TCEQ experience, Case 3 would be the most common scenario, so qualitative approaches should be included in this section.
- Quantitative Cumulative Analysis. The guidance should address the specifics of which values to include in the sum of the modeled direct $PM_{2.5}$ and secondary $PM_{2.5}$ impacts and the monitored (background) values. Further, the guidance does not address how to determine the modeled design value of secondary $PM_{2.5}$ impacts from photochemical modeling. As stated previously, it is unclear which time periods permit authorities should consider to develop the emission inventory and meteorological data files. It is not clear how extensive photochemical modeling inventories need to be as well. For example, should the inventory include precursors that are assumed out (VOC and ammonia sources) in order to adequately represent the complex chemistry of $PM_{2.5}$ formation?
- Background Concentrations. A photochemical grid modeling platform will generally cover a large geographic area and will therefore automatically provide a background value for the project location through explicit inclusion of both nearby and distant sources as well as its own boundary conditions on the periphery of the modeling grid. Adding a separate observed background concentration would amount to double counting. TCEQ suggests an approach comparing modeled and measured concentrations at one or more background monitors and adjusting the final modeled concentrations to account for any differences (similar to the bias adjustment implicit in the relative reduction factors approach described in EPA-454/B-07-002 (2007 Ozone/PM/Regional Haze Modeling Guidance).
- Significant Impact (Cause or Contribute). It is unclear how an applicant who conducts photochemical modeling would demonstrate that the project's emissions do not cause or contribute to a predicted violation of the NAAQS.

  Specifically, it is unclear how an applicant should combine the results from AERMOD (direct $PM_{2.5}$) and a photochemical model (secondary $PM_{2.5}$) to determine if the project's emissions result in a significant impact at a specific location and time period. EPA should discuss the process applicants should follow and provide examples.

  In addition, TCEQ is concerned about EPA's statement that "*full temporal and spatial pairing of primary and secondary* $PM_{2.5}$ *impacts may not be appropriate in many cases due to the fact that photochemical grid modeling represents gridded concentration estimates whereas dispersion modeling*

produces estimates at discrete receptor locations and the limitations in the skill of both the dispersion model and the photochemical grid model to accurately predict impacts on a paired in time and space basis." The EPA should focus its resources to develop a model that can assess the impact of a single source for both direct and secondary $PM_{2.5}$ concentrations.

V. $PM_{2.5}$ Increment Analyses

EPA should clarify and provide examples of how to perform cumulative PSD increment analyses using qualitative, hybrid, and full quantitative approaches.

EPA should provide more detailed examples to describe how modeled impacts from primary $PM_{2.5}$ and its precursors should be determined for PSD increments.

- Modeling Process to Determine Increment Consumption. EPA provided a summary of the historical increment modeling approach in the 2010 rule adoption preamble.[19] EPA should include the approach in this guidance document with examples.
- Significant Impact (Cause or Contribute). The guidance should discuss how to determine significance in the context of PSD increments and whether the approach differs from the NAAQS analysis since the form of the NAAQS and PSD increments differ.
- Qualitative Cumulative Analyses. The guidance should explain how a qualitative analysis addresses the 40 CFR §51.166(2)(q)(iii) requirement to include the degree of increment consumed by the project for public notice. The qualitative example given in Appendix C does not address PSD increments. EPA should provide examples.
- Quantitative Cumulative Analyses. The guidance should explain how to conduct a quantitative assessment of secondary $PM_{2.5}$ impacts. It is unclear whether the quantitative assessments discussed for NAAQS demonstrations are relevant for PSD increment demonstrations.
- Use of Ambient Monitoring Data. The guidance suggests that ambient monitoring data could be used to account for emissions from background sources. Among other issues related to increment analysis, EPA needs to provide explicit guidance detailing how monitoring data could be used since the monitored concentrations would include contributions from non-increment consuming sources (background sources).
- Condensable $PM_{2.5}$. The guidance should explain how to consider condensable $PM_{2.5}$ emissions that existed before January 1, 2011, but may not have been

[19] 75 Fed.Reg. 64869. Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC), October 20, 2010.

explicitly included in a permit authorization. In other words, when can major sources include condensable emissions in the baseline concentration?

- $PM_{2.5}$ Precursor Emissions. EPA should explain how precursor emissions from the source should be integrated into the analysis to determine the baseline area and how applicants would qualitatively determine the extent of the baseline area.
- Minor Source $PM_{2.5}$ Precursor Emissions. EPA should explain how precursor emissions from minor stationary and area sources should be identified, tracked, and modeled.

VI. Miscellaneous Issues

Exceptional Events

Permitting authorities should be able to consider the effects of exceptional events when evaluating appropriate background concentrations.

EPA should either include a discussion in this guidance document or a reference to the appropriate guidance on its policy related to the use of the exceptional events to refine the monitored background concentrations. The guidance should be specifically developed to implement the NAAQS in PSD permitting to adequately outline the EPA's expectations of permitting authorities and ensure a nationally consistent approach.

Receptor Placement

EPA should discuss receptor placement and use of appropriate monitoring data for background concentrations.

In the January 2013 final particulate matter NAAQS rule,[20] EPA recommends that specific receptor locations used in PSD air quality analyses should be evaluated consistent with the monitoring regulations.[21] EPA should include a discussion of receptor placement in this guidance document. In addition, EPA should provide examples when $PM_{2.5}$ monitored data should not be used, e.g., unique micro-scale, or localized hot spot, or unique middle-scale monitors that are not eligible for comparison to the annual $PM_{2.5}$ NAAQS.

Offsets for PSD Projects in Attainment Areas

EPA should discuss how to use offset emissions in attainment areas.

EPA should discuss how to address projects in areas that have monitored violations of the 24-hour or annual $PM_{2.5}$ NAAQS but have not been formally designated nonattainment. EPA should discuss the issue and provide examples that address direct $PM_{2.5}$ and secondary $PM_{2.5}$. In addition, EPA should clarify the intent, and provide permit implementation examples, of the following statement in the January 2013 final particulate matter NAAQS rule "... *it may not be necessary for a permit applicant to fully offset the proposed emissions increase if an emissions reduction of lesser quantity*

[20] 78 Fed.Reg. 3253. National Ambient Air Quality Standards for Particulate Matter, January 15, 2013.
[21] 40 CFR § 58.30

will be sufficient to mitigate the proposed source's adverse air quality impact on a modeled violation."[22]

PSD and Nonattainment Guidance

EPA should consider harmonizing PSD and Nonattainment guidance.

The PSD and Nonattainment NSR programs have been kept separate in some regulatory agencies primarily due to resources, scope of work, and regulatory differences between programs. It may be time to harmonize approaches for pollutants such as $PM_{2.5}$. The TCEQ notes that EPA provided Draft Guidance on Area Designations for the 2012 Revised Fine Particle National Ambient Air Quality Standard in February 2013.[23] Some of this guidance applies to NSR permitting and should be adapted or directly referred to in the permit modeling guidance document. Some examples include the datasets the EPA will provide via the EPA PM Designations Webpage to mitigate the concern that some of the recommended assessments can be resource intensive, and information provided for the five factor area specific analyses.

New Major Sources

EPA does not specifically address new major sources in the tables.

The guidance specifically addresses only major modifications in the tables. The guidance should include a discussion on new major sources, minor sources with major projects, and the applicability of greenhouse gas (GHG) thresholds for PSD that consequently trigger requirements for additional pollutants and when these sources would trigger a review for $PM_{2.5}$. For example, TCEQ understands that a GHG-only source can obtain a GHG plant-wide applicability limit that would not make GHGs "subject to regulation" and bring the source into major stationary source status under the Tailoring Rule. Or, a minor source that is not one of the named source categories may have new direct $PM_{2.5}$ emissions above the $PM_{2.5}$ SER but less than 250 tons per year. Since the source is not major, no $PM_{2.5}$ PSD demonstration would be required. If EPA has a different understanding of this issue, it should be specifically stated in the guidance.

Text and Table Consistency

The text should match the information in Table II-1.

TCEQ notes that the text immediately following Table II-1 does not match the limits in the table. For example, the text contains guidance SERs less than and greater than the thresholds but omits SERs that are equal to the SER. This is a minor oversight, but should be addressed to avoid confusion.

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[22] *Id.* 3162.

[23] Draft PMD guidance_22613_external review_r2 (2) (2).pdf