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Submitted via bridgers.george@epa.gov

April 17, 2020

Mr. George Bridgers
U.S. Environmental Protection Agency
109 T. W. Alexander Drive
Research Triangle Park, NC 27709

RE: API Comments on EPA's *DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling*

Dear Mr. Bridgers:

The American Petroleum Institute (API) provides the attached comments on the Environmental Protection Agency's (EPA) *DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling* (Publication EPA-457/P-20-002) dated February 2020.

API is the only national trade association representing all facets of the oil and natural gas industry, which supports 10.3 million U.S. jobs and nearly 8 percent of the U.S. economy. API's more than 600 members include large integrated companies, as well as exploration and production, refining, marketing, pipeline, and marine businesses, and service and supply firms. Modeling procedures associated with the permitting of new and modified sources directly impact our members.

API appreciates the EPA's efforts in providing this guidance, and supports the determination that emission increases of applicable pollutants below the Significant Emission Rate (SER) do not need to be modeled.

Thank you for your consideration of these comments. If you have any questions, please contact me at (202) 682-8318 or kaliszc@api.org.

Sincerely,

Cathe Kalisz

Cathe Kalisz

Attachment

American Petroleum Institute (API)

Comments on EPA's *DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling*

Publication No. EPA-457/P-20-002 issued February 10, 2020

April 17, 2020

Comments on EPA's Draft Guidance for Ozone and Fine Particulate Matter Permit Modeling
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API Comments on EPA's Draft Guidance for Ozone and Fine Particulate Matter Permit Modeling

The American Petroleum Institute (API) provides the following comments regarding the United States Environmental Protection Agency's (EPA's) *DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling* ("Draft Guidance" or "Guidance"), issued on February 10, 2020. This guidance was referenced in the latest revisions to the Guideline on Air Quality Models (40 CFR Part 51 Appendix W) promulgated on January 17, 2017 (82 FR 5182) as Reference 59. The Draft Guidance relies upon and references select EPA guidance documents[1] that have been issued since January 2017, but for which EPA did not solicit comments. Due to the reliance of the Draft Guidance on these previously issued documents, API's comments address these referenced guidance documents as well.

1.0 API Generally Supports the Draft Guidance for Ozone and $PM_{2.5}$ Permit Modeling.

1.1 This Guidance completes the 2017 Appendix W list of citations, and the Appendix W reference should be updated when the Guidance is finalized.

It is our understanding that the Draft Guidance is intended to fulfill Reference 59 in the 40 CFR Part 51 Appendix W updates promulgated in 2017. API recommends that EPA update the Appendix W reference when the Draft Guidance is finalized because this ozone and particulate matter (PM) permit modeling guidance has not been available until now, and since the Draft Guidance has a different publication number than that cited in Reference 59.

1.2 Useful updates from past guidance documents have been made.

Previous guidance documents have been released by EPA, including: (1) $PM_{2.5}$ modeling (2014)[2], (2) modeling guidance for secondary formation of ozone and $PM_{2.5}$ (2016)[3], (3) guidance for Significant Impact Levels (SILs) for ozone and $PM_{2.5}$ (2018)[4], and (4) the Tier 1 MERPs guidance (2019)[2]. EPA has added ozone permitting guidance for the first time in this Draft Guidance and has clarified modeling requirements for precursor ozone and $PM_{2.5}$ pollutant emissions as well as primary $PM_{2.5}$ emissions. In Tables III-1 and III-2 of the Guidance, EPA now more clearly specifies that each pollutant (either a precursor or primary type) is to be included in the SIL modeling only if the pollutant is emitted in significant quantities. EPA defines significant quantities in the Guidance by using the Prevention of Significant Deterioration (PSD) Significant Emission Rate (SER) thresholds defined in

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[1] For example, the updated versions of the MERPs Guidance (i.e., Tier 1 Assessment Approach) and the Single-source Modeling Guidance (Tier 2 Assessment Approach) are incorporated by reference in the Draft Guidance, but the content of those documents is not specifically included in the Guidance.

[2] EPA, 2014. "Guidance for $PM_{2.5}$ Permit Modeling", https://www3.epa.gov/ttn/scram/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf.

[3] EPA, 2016. "Guidance on the Use of Models for Assessing the Impacts of Emissions from Single Sources on the Secondarily Formed Pollutants: Ozone and $PM_{2.5}$", https://www3.epa.gov/ttn/scram/appendix_w/2016/EPA-454_R-16-005.pdf.

[4] EPA, 2018, "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program", https://www.epa.gov/sites/production/files/2018-04/documents/sils_policy_guidance_document_final_signed_4-17-18.pdf.

40 CFR §51.166(b)(23). API supports this policy and provides further discussion in Section 4 of these comments.

1.3 The Draft Guidance could be improved by providing more examples and other types of information.

As discussed in Section 4, the single example provided in Appendix C should be updated. API also suggests the addition of more examples where different $PM_{2.5}$ and/or ozone precursor emissions are above the PSD SERs. Appendix C could also include a scenario for PSD Class I modeling with long-range transport considerations. The issue of distance-dependent concentration estimates in general is important, and is discussed further in Section 3. Additional clarification on cumulative modeling approaches is also needed, as discussed below in Sections 5, 8, 9, and 10.

2.0 The Guidance Should not be Limited to "Permitting".

The Draft Guidance should clarify that its applicability is not limited to permitting of new or modified emission sources. There are cases in which these same procedures should be applied, for consistency, when compliance with ambient air quality standards needs to be demonstrated.

Examples of such analyses outside of New Source Review permitting are:

- Modeling to demonstrate that a facility's currently permitted emission rates result in compliance with the NAAQS (some states require modeling to support Title V permit renewals).

- Modeling in response to a State Implementation Plan (SIP) call, or any other regulatory action or challenge that requires modeling of an existing source's emissions when there is a question as to whether the emissions would cause or contribute to a NAAQS violation.

3.0 The Distance-Dependent Tier 1 Assessment Information is Important for Short-Range Modeling.

3.1 For $PM_{2.5}$ modeling, combining primary and secondary impacts as a function of distance can be important.

The April 2019 MERPs guidance provides some discussion on distance-dependent concentrations of $PM_{2.5}$ from SO_2 and NOx precursor emissions, but it primarily focuses upon long-range transport applications involving PSD Class I areas. EPA has provided additional information on secondary $PM_{2.5}$ concentrations as a function of distance with an online tool ("MERPs View Qlik") at https://www.epa.gov/scram/merps-view-qlik. However, the Draft Guidance only briefly mentions (page 39) the possibility and importance for combining the results of the AERMOD direct $PM_{2.5}$ impact with the secondary $PM_{2.5}$ information available from the MERPs View Qlik tool as a function of distance. The Draft Guidance allows for "considerations of spatial pairing that reflects the general lack of correlation between primary and secondary impacts, i.e., primary impacts being higher near the source while secondary impacts being higher at some distance away from the source." To address this concern, we provide a suggested approach in the next subsection.

3.2 A spreadsheet or other tool could facilitate spatial pairing of the modeled results for direct and secondary $PM_{2.5}$.

A spreadsheet or other tool yet to be developed can facilitate the spatial pairing with distance that is discussed on page 39 of the Draft Guidance. For the distance at which peak concentration information (independent of wind direction) is provided by the Tier 1 secondary $PM_{2.5}$ modeling results, the modeling of direct $PM_{2.5}$ using AERMOD can also provide peak direct $PM_{2.5}$ modeled concentrations (independent of wind direction) at the same distance so that the pairing with distance can be done. Since the Tier 1 modeling results are available at 10-km intervals in the Qlik tool, the 10-km secondary $PM_{2.5}$ modeling results could be paired with the peak direct $PM_{2.5}$ results for distances up to 10 km, the 20-km secondary $PM_{2.5}$ modeling results could be paired with the peak direct $PM_{2.5}$ results for distances between 10 and 20 km, and so on.

AERMOD does not yet have an option that provides this type of output, but it could be developed as a post-processor. These results would then be summed for specified distances, and the resulting total overall distances reviewed. The maximum over the distances considered would be the controlling concentration.

4.0 EPA has Appropriately Indicated that Emission Increases of Applicable Pollutants Below the SER do not need to be Modeled.

4.1 This policy is consistent with PSD applicability convention.

PSD permitting applies to new major sources or major modifications at existing sources when the proposed project is located in an area that is classified attainment or unclassifiable with the NAAQS for applicable pollutants.[5] When PSD permitting applies, it requires an air quality modeling analysis only for those pollutants with an emissions increase at or above the PSD SER threshold for that pollutant. Therefore, it is appropriate that the Draft Guidance does not require modeling of direct or precursor pollutants if the emissions increase for the pollutant is below the SER.

4.2 A review of the MERPs indicates that the SER levels for precursor pollutants would always result in insignificant impacts.

For precursor pollutant emissions just at the SER levels (40 tons per year for SO_2, NOx, and VOCs), it is evident that the combined precursor pollutants Tier 1 MERP concentration would be well under the SIL for both ozone and $PM_{2.5}$. For ozone, the lowest MERPs anywhere in the country are 125 TPY for NOx and 1,049 TPY for VOCs. For $PM_{2.5}$, the lowest MERPs between the daily and annual averaging times are 188 TPY for SO_2 and 1,073 TPY for NOx. It is apparent that the SER value of 40 TPY is a small fraction of these worst-case MERPs. Accordingly, the exclusion of the contributions for small emission increases of a precursor pollutant for a proposed source is appropriate because the concentration impact is a low fraction of the SIL.

4.3 The example in Appendix C should be updated to indicate that SO_2 precursor impacts do not need to be considered since the project SO_2 emissions were below the SER.

Appendix C provides a helpful example of the application of the Tier 1 approach for assessing ozone and secondary $PM_{2.5}$ impacts. However, we note that example Equations 4.2 and 4.3, which determine the combined $PM_{2.5}$ impacts for comparison to the annual and 24-hour SILs, include the

[5] https://www.epa.gov/nsr/prevention-significant-deterioration-basic-information.

impacts from a 14.2 ton SO_2 emissions increase. Since the Draft Guidance now appropriately indicates that impacts from an emissions increase below the SER (40 tons per year for SO_2) do not need to be considered, the example should be updated to reflect this.

5.0 For Cumulative Modeling, EPA Procedures for how Nearby Sources are Modeled need Further Clarifications.

5.1 EPA's updates to the 2017 Appendix W Table 8-1 need further clarifications for specifying realistic emission rates for nearby sources.

For a cumulative modeling exercise, which is mentioned in the Draft Guidance Sections IV.1 and V.2, EPA requires the characterization of concentrations from both nearby and distant sources. The difference between these two categories is that distant sources do not generally have a spatially varying impact and can thus be represented by monitoring data. The values used from the monitoring data are conservatively high, representing a high percentile statistic comparable to the form of the standard (e.g., 98th percentile value for $PM_{2.5}$).

Modeling is required for nearby sources because the resulting concentrations can vary in space as well as in time. In its Appendix W updates, EPA attempted to create more realism for this characterization, but addressed only one of the factors used in the emission rate calculation, the operating level. EPA did not address the two other factors (emissions limit in lb/MMBtu and operating factor, hr/year). While addressing one factor was a step toward more realism, additional clarifications are needed to make this more realistic and workable. For example:

- The three factors are not applicable for emissions from processes that do not burn fossil fuels. An example of this is SO_2 emissions from smelting activities; the emissions come from a process that liberates SO_2 via a chemical or thermodynamic reaction, rather than fuel consumption.
- Even for fuel consumption, there are many cases where the highest operating levels (e.g., full load) do not correspond to the periods of the highest emission rate in lb/MMBtu. The combination of these parameters to a single lb/hr parameter is more relevant than treating them separately.
- In other cases, sources in a group do not act independently. For example, when one unit is down, the one next to it is operated at a very high level. Assuming that all units are operated simultaneously at peak levels is unrealistic.

In general, the three factors should be combined into a short-term emission rate that might vary by season for short-term $PM_{2.5}$, much like the regional background monitoring data used for the distant sources. CEM data can inform the decision as to the emission levels to be used for "typical actual" levels.

5.2 EPA's treatment of emissions from nearby sources should be clarified.

The definition of "nearby sources" should be clarified as including <u>any</u> source, even at the same facility as that involved in the proposed project, whose emissions are not affected by the proposed activity. The latest Appendix W discussion in Section 8 is inconsistent on this point, in that Table 8-2 (for NAAQS compliance in PSD demonstrations) has a footnote not included in Table 8-1 (for SIP revisions). The footnote for Table 8-2 states that nearby sources include "existing facility to which

modification is proposed if the emissions from the existing facility will not be affected by the modification." That same footnote should also be applied for Table 8-1.

In a presentation made by EPA at the 2019 RSL modeling workshop[6], EPA stated that, for nearby sources, "Co-located actuals are possible for source units not under consideration for a revised emissions limit and are not being impacted (positively/negatively) by modification." However, we are aware of a recent proposed project in EPA Region 5 where a facility was requested to demonstrate compliance with the NAAQS as a result of changes in permitted emission limits for some, but not all, of the facility sources. The facility was requested to model the non-affected facility emission units at their maximum levels because Table 8-1 does not include the clarification regarding treatment of nearby sources.

It would be helpful if EPA, in its revisions to the Draft Guidance, provided additional clarification to eliminate inconsistencies regarding the modeling of nearby sources for such circumstances.

6.0 The April 2019 MERP Guidance Updates Were Very Helpful, Although the MERP Selection Process Could Be Further Clarified.

Several helpful changes made to the MERPs guidance dated April 30, 2019 versus the original December 2, 2016 guidance included:

- More MERP sites were added, which filled in some sparsely-represented locations in the United States.
- MERPs were categorized by the 9 climatic zones for the continental United States.
- More information about site characteristics was provided to help guide the selection of the appropriate MERP site. Besides location proximity, the characteristics include urban/rural features, topography, and proximity to population centers.
- Limited information on distance-dependent $PM_{2.5}$ concentrations due to secondary formation was provided. (This was subsequently expanded with EPA's release of the MERPs View Qlik database.)

One aspect of the April 2019 MERP guidance that has caused some confusion is the fact that the various scenario examples had different approaches for the MERP site selection. Some examples settled upon a conservatively lower MERP value, and others had a refined approach. Other than perhaps stopping the analysis when it "worked", there was no clear indication of the most appropriate approach for selecting a MERP site. Further clarification of the selection process would be helpful.

7.0 EPA Should Adopt Regional Haze Rule Modeling Platforms for Tier 2 Applications.

While Tier 2 modeling provides the potential for more refined modeling estimates, EPA's Tier 2 guidance provides a challenging and resource-intensive set of requirements for getting approval for a modeling approach. In addition, many states lack the ability to review modeling applications with this approach.

For another EPA program, the Regional Haze Rule second decadal review, regional and national modeling platforms are being developed to track visibility trends through the year 2028, and all states are involved in this program. EPA should connect these platforms and their evaluation / performance

[6] Slide 6 at http://www.cleanairinfo.com/regionalstatelocalmodelingworkshop/archive/2019/Presentations/3-2_2019_RSL-Breakout_Summaries.pdf

documentation, when fully developed and available, to the Tier 2 modeling for secondarily formed ozone and $PM_{2.5}$ permitting needs. EPA should take advantage of this work and acknowledge in their guidance that these modeling platforms can be used for Tier 2 assessments such that minimal further work should be needed to obtain agency approval.

For example, the Intermountain West Data Warehouse (IWDW[7]) makes such regional photochemical modeling databases available to all at no cost, and so provides a resource for well vetted publicly available modeling platforms.

8.0 Certain Key Parameters Need to be Considered in the Selection of a Background Monitor that Characterizes Existing Ozone and $PM_{2.5}$ Concentrations.

A key issue for a cumulative analysis is to determine the concentration levels of ozone or $PM_{2.5}$ that are present due to emissions from existing sources. Due to the distance required for the formation of ozone and secondary $PM_{2.5}$ concentrations, the presence of monitoring data within several tens of kilometers of a proposed source is sufficient to determine representative background concentration levels.

The Draft Guidance indicates that the monitored background accounts for the effects of precursor emissions from existing sources, which should not be included in modeling to avoid double-counting. In addition, API expects that gradients of the secondary ozone and $PM_{2.5}$ concentrations will generally be low. However, due to seasonal differences in ambient levels, the background levels considered for modeling can be categorized by season for considering in the cumulative modeling analysis.

Wade et al. (2006)[8] reviewed monitoring data from the EPA's Air Quality System, the Southeastern Aerosol Research and Characterization database, and the Assessment of Spatial Aerosol Composition in Atlanta database for 1999 through 2002. This study was designed to characterize errors associated with instrument precision and spatial variability on the assessment of the variation of ambient air pollution in the Atlanta, Georgia region. The authors found that, as they expected, the concentration plots of ozone and $PM_{2.5}$ do not show strong effects of wind direction. Both ozone and much of fine particulate matter are secondary pollutants, and secondary pollutants are less affected by emission sources than primary pollutants. In some cases, however, ozone minima are observed in directions where NOx emission peaks occur because of ozone inhibition by radical scavenging and the titration of ozone by NO. Conversely, in areas of high primary $PM_{2.5}$ emissions, there can be peak concentrations in $PM_{2.5}$. These potential phenomena should be considered when the background site is selected to characterize the impact of existing $PM_{2.5}$ precursor emissions.

For situations with multiple representative monitors, the guidance indicates that a representative monitoring station would not necessarily be the one with the highest observations. It would be more statistically robust to take an average over the available representative monitors.

It is also important to carefully select the years of monitoring to be considered for the choice of the current background concentration of ozone or $PM_{2.5}$. Due to recent source retirements, monitored concentrations that are 2 or 3 years old could significantly overstate the current levels of background

[7] https://views.cira.colostate.edu/iwdw/

[8] Wade KS, Mulholland JA, Marmur A, Russell AG, Hartsell B, Edgerton E, et al. Effects of instrument precision and spatial variability on the assessment of the temporal variation of ambient air pollution in Atlanta, Georgia. *J Air Waste Manag Assoc.* 2006; 56:876–888.

concentrations. In such a case, the use of just one or two years of monitoring data could be warranted. In any case, a careful review of both the location and the trend of monitored concentrations is needed to avoid selecting outlier values for the characterization of current background levels.

9.0 Accounting for the Secondary $PM_{2.5}$ Impacts of Newly Permitted Background Sources in Cumulative Modeling Could Consider a Conservative Summing of Impacts or a Distance-Dependent Approach.

Aside from the proposed project emissions, there are two main components to the cumulative NAAQS analysis for the secondary $PM_{2.5}$ component: a) existing emissions that are accounted for by suitably representative monitors, and b) newly permitted background sources not yet in operation. A conservative modeling approach for addressing the second category (sources modeled individually) would be to use a Tier 1 MERP concentration for each of the newly permitted sources, assuming a small number of these sources. This approach could conservatively add peak impacts together, even though the locations of and distances to the peak impacts are not the same.

This method could be refined by using a distance-dependent Tier 1 approach as discussed earlier. For example, consider a case where there is one permitted source and two background sources not yet operating (or operating for an insufficient time to be captured in the monitoring database), so they have to be modeled. Assume that one of the background sources ("Source 1") is 10 km from the source to be permitted, and the other ("Source 2") is 20 km away. The distances to be used for each source to determine the peak concentrations to add to monitored background would then be as follows:

- All distances for the source being permitted would be considered
- All distances beyond 10 km from Source 1 would be considered, and
- All distances beyond 20 km from Source 2 considered.

This strategy reflects the issue that for a line-up case with the source being permitted, the plume from a background source has to travel at least the distance to the source being permitted in order to superimpose its impact on top of the impact from that source. Therefore, near-field distances that cannot result in a combination of the background source with the permitted source would be eliminated from consideration.

These procedures would still result in a conservatively high total because the sources will not always line up. A Tier 2 approach may be needed if a more refined modeling result is desired.

10.0 Footnote 18 on Page 45 Regarding the Use of Background Monitoring Data Needs Further Clarification.

The footnote on page 45 of the Draft Guidance addresses the issue of an existing source seeking a permit for a modification with increased precursor emissions. EPA indicates in the footnote that "…there is potential overlap across secondary impacts from monitored background and from precursor emissions from the existing source. In such cases, recommendations for excluding monitored values when the source in question is impacting the monitoring in section 8.3.2.b of the 2017 *Guideline* may need to be modified to avoid overcompensating in cases where the monitored concentrations are also intended to account for the existing source's impacts on secondary $PM_{2.5}$."

First, we question whether it is section 8.3.2.c.i of the *Guideline* that EPA intended to reference in the footnote. Second, it seems potential overlap would only be an issue if the total source emissions are

modeled. A way to avoid "potential overlap" is to model only the change in emissions for a facility, rather than the emissions from the entire facility. The monitor already accounts for the existing emissions.

This modeling approach is still likely to be conservative because the MERP tables for different source emission levels for a given stack height (e.g., 500, 1000, and 3000 TPY of a precursor emission rate) indicate that the normalized concentrations (or "chi/q") results are highest for the lowest emission rates modeled. Therefore, the sum of the concentration results from two separate runs for a 500 TPY source doubling in size would be expected to be higher than a single run using a 1000 TPY source. For this hypothetical case of a 500 TPY NOx source expanding and adding 500 TPY more to its emissions, the approach would be to use monitoring to account for the existing 500 TPY source and the MERP tables to account for the 500 TPY being added.

EPA should confirm the appropriate *Guideline* reference in footnote 18 and provide further clarification of the background monitor scenario discussed.

11.0 EPA Should Clarify that a Tier 1 or Tier 2 Approach Could Be Used When Modeling Background Emissions Growth for $PM_{2.5}$ Increment Consumption.

On page 72 of the Draft Guidance, EPA discusses modeling approaches for areas where $PM_{2.5}$ precursor emission increases from other sources have occurred since the major or minor source baseline dates of the precursor emissions. In their discussion, EPA refers to "chemical transport modeling methods…discussed in Section III of this guidance" that may be appropriate for estimating the portion of $PM_{2.5}$ increment consumed due to precursor emissions.

It is becoming increasingly unlikely that emissions of SO_2 or NOx have increased since their respective minor source baseline dates if these baseline dates are several years ago, due to emission reductions that have occurred over time due to several regulatory programs (tighter NAAQS, Regional Haze Rule, source retirements, lower mobile emissions, SIP calls, etc.). In the event of emission increases and decreases of criteria pollutants, interpollutant trading could be considered using MERPs data.

In the unlikely case of precursor emission increases since the applicable baseline dates, then the modeling approach should consider a tiered procedure that starts with Tier 1 and proceeds to Tier 2 only if necessary.