MEMORANDUM

To: George Bridgers (bridgers.george@epa.gov), EPA Office of Air Quality Planning and Standards
From: Michael Hammer, CCM, Chair A&WMA APM Committee, On behalf of the A&WMA APM Committee
CC: Sergio Guerra, Vice-Chair, A&WMA APM Committee;
Abhishek Bhat, Secretary, A&WMA APM Committee;
Tony Schroeder, CCM, QEP, CM, A&WMA APM Ad Hoc Sub-Committee Chair
Date: April 17, 2020
RE: A&WMA APM Ad Hoc Sub-Committee Technical Comments on EPA's Draft Guidance for Ozone and Fine Particulate Matter Permit Modeling

On February 10, 2020, the U.S. Environmental Protection Agency (EPA) posted to the Support Center for Regulatory Atmospheric Modeling website[1] a draft version of Guidance for Ozone and Fine Particulate Matter Permit Modeling (Publication No. EPA-457/P-20-002) for public consideration, review, and comment. Concurrently, EPA issued a memorandum announcing a public comment period during which comments would be accepted.

The Atmospheric Modeling and Meteorology Technical Coordinating Committee (APM) of the Air and Waste Management Association (A&WMA) is a technical organization comprised of members from regulated industries, the consulting industry, academia, and state and federal regulatory agencies. The mission of the APM is to encourage and facilitate the development, advancement, and use of state of-the-art methods of meteorological and atmospheric dispersion analysis as a foundation for effective environmental design of air emissions sources and for assessment of environmental impacts of air emissions. As such, APM has interest in the technical aspects of the air dispersion modeling tools and guidance released by EPA. The APM Committee of the A&WMA respectfully submits these technical comments, drafted by APM's Ad Hoc Sub-Committee, on the draft version of the Guidance for Ozone and Fine Particulate Matter Permit Modeling document for your consideration.

The APM Committee supports attempts by EPA to improve the usefulness and representativeness of air dispersion modeling tools and guidance, such as the draft Ozone and Fine Particulate Matter Permit Modeling guidance. As such, APM submits the following comments for EPA's consideration.

[1] https://www3.epa.gov/ttn/scram/guidance/guide/Draft_Guidance_for_O3_PM25_Permit_Modeling.pdf

1) APM appreciates EPA's release of this draft modeling guidance to help clarify and standardize techniques used to model direct fine particulate matter ($PM_{2.5}$) as well as secondarily formed $PM_{2.5}$ and ozone resulting from emissions of precursors for permitting purposes. This guidance document was cited as Reference 59 in the 40 CRF Part 51 Appendix W updates promulgated in 2017 but has not been available until now. Therefore, this document finally completes the available references listed in Appendix W.

2) In general, APM finds that the single example provided in Appendix C should be updated, and that additional examples would be helpful (for example, 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 comments below. Additional discussion of cumulative modeling approaches is also needed.

3) Pollutant precursors for secondary formation include oxides of nitrogen (NOx) and sulfur dioxide (SO_2) for $PM_{2.5}$ and NOx and volatile organic compounds (VOCs) for ozone. The draft guidance does not address how to accommodate a case in which there are significant increases as well as decreases in pollutant emissions among the precursors. Consideration of both increases and decreases are necessary to accurately quantify impacts on air quality for air permitting assessments.

4) Section II.1 of the draft guidance provides significant emission rates (SERs) for precursors to ozone and $PM_{2.5}$. Recent literature (i.e., recent MERPs guidance) has shown that these levels are not commensurate with a significant level of ozone or secondary $PM_{2.5}$ formed in the atmosphere. We encourage EPA to consider the potential impact of the current precursor PSD SERs on significant impact levels and potentially revise these if warranted.

5) Tables III-1 and III-2 of the draft guidance clarify that the air quality assessment for ozone and $PM_{2.5}$ should address direct $PM_{2.5}$ if emissions exceed the SER for direct $PM_{2.5}$ and/or precursors for each precursor for which emissions exceed the relevant SER. We support this approach, which is consistent with the approach specified in EPA's 2014 $PM_{2.5}$ Permit Modeling Guidance and the practice of addressing other PSD requirements only for pollutants for which the SERs are exceeded for a project.

6) In 2008, EPA promulgated "preferred" interpollutant trading ratios for $PM_{2.5}$ precursors (73 FR 28321, 28339-40; May 16, 2008). However, in 2011[2], EPA issued updated guidance that revised this policy. Upon re-examination of their original data in 2011, EPA then believed that the original preferred ratios promulgated in 2008 were not sufficiently representative of conditions

[2] EPA, 2011. "Revised Policy to Address Reconsideration of Interpollutant Trading Provisions for Fine Particles (PM2.5)". July 11, 2011. https://www.epa.gov/sites/production/files/2015-07/documents/pm25trade.pdf.

(conservative enough) in all areas of the country. With the extensive photochemical grid modeling conducted for the MERPs approach in many areas of the country, it is now appropriate to reconsider this policy, such that case-specific interpollutant ratios can be considered for permitting applications.

7) For $PM_{2.5}$ modeling, combining the primary and secondary impacts as a function of distance is important. The MERPs guidance from April 2019 does provide 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 PM2.5 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 permitting guidance only briefly mentions the possibility and importance for combining the results of the AERMOD direct $PM_{2.5}$ impact with the distance-dependent $PM_{2.5}$ information available from the MERPs View Qlik tool as a function of distance on page 39. The language on that page 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."

   A spreadsheet or another tool yet to be developed can facilitate the spatial pairing with distance that is discussed on page 39 of the draft document. For distances at which peak concentration information (independent of wind direction) is provided by the secondary $PM_{2.5}$ modeling results, the modeling of direct $PM_{2.5}$ using AERMOD would also need to provide peak direct $PM_{2.5}$ modeled concentrations as a function of distance (independent of wind direction), and at the same distances so that the pairing with distance can be done. AERMOD does not yet have an option that provides that 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 over all distances reviewed. The maximum over the distances considered would be the controlling concentration.

8) The draft guidance recommends the use of the same Modeled Emission Rates for Precursors (MERPs) values for precursors to $PM_{2.5}$ and ozone in the Significant Impact Level (SIL), National Ambient Air Quality Standards (NAAQS), and increment analyses to address secondary formation. The MERPs that have been published to date are based on the peak concentration for the averaging period of the standard (e.g., 8-hour for ozone) associated with a rate (e.g., tons per year) of emissions. Use of the peak concentration for an emission rate is consistent with the typical form of SILs, for which first highest modeled concentrations are compared with the standards. However, compliance with the NAAQS and increment standards for short term averaging periods for $PM_{2.5}$ and ozone is not evaluated based on peak concentrations. The 24-hour $PM_{2.5}$ NAAQS is in the form of a 98^{th} percentile of daily concentrations over an annual period (i.e., 8^{th} high), the 8-hour ozone NAAQS is in the form of the 4^{th} highest daily maximum 8-hour average concentration over an annual period, and the 24-hour $PM_{2.5}$ increment is the 2^{nd} highest value over an annual period. Different peak, 2^{nd} high, 99^{th} percentile, and 98^{th} percentile concentrations will result when modeling a single ton per year emission rate. Use of a MERP based on the ratio of peak concentration to annual emission rate will

result in an estimated concentration that is not consistent with the form of the NAAQS and increment standards. APM therefore suggests that EPA consider establishing different MERPs values for different standards that are consistent with the form of each standard and more consistent with practices for evaluations of compliance using air quality model and monitor data.

9) A key issue for accumulative analyses 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 secondary ozone and $PM_{2.5}$ concentrations, the presence of monitoring data within several tens of kilometers of a proposed source is sufficient to determine representative background concentration levels.

   APM agrees with the draft guidance that 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, APM 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 could be categorized by season for considering in the cumulative modeling analysis.

   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 only 2 or 3 years old could still significantly overstate the current levels of background 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.

We appreciate the opportunity to provide comments on this draft guidance and look forward to continuing to work with EPA to improve the science of air dispersion modeling.