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c/o Air and Radiation Docket and Information Center
Attention Docket ID No. EPA-HQ-OAR-2013-0691
United States Environmental Protection Agency
Mail Code 28221T
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements; Proposed Rule (80 FR 15340)

The Environmental Protection Agency (EPA) originally promulgated the National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$ and addressed requirements for non-attainment areas under only the provisions of Title I, Part D, Subpart 1 of the Clean Air Act (addressing non-attainment areas in general). On January 4, 2013, the U.S. Court of Appeals, D.C. Circuit remanded the implementation rule back to EPA to re-promulgate pursuant to the additional requirements of Subpart 4, which specifically address areas in non-attainment for particulate matter (PM). EPA proposed a revised rule addressing implementation of the $PM_{2.5}$ NAAQS on March 23, 2015 (80 FR 15340), which is the subject of the following comments.

The USDA Agricultural Air Quality Task Force (AAQTF) is a Federal Advisory Committee (FACA) under the direction of the Natural Resources Conservation Service (NRCS). The AAQTF is comprised of a diverse set of stakeholders from industry, agriculture, academia, government agencies, non-government organizations, and other agricultural and environmental experts from across the US. Following are the comments and concerns of the AAQTF regarding the proposed rule addressing implementation of the $PM_{2.5}$ NAAQS.

General Comments

The proposed rule is written in an extremely general manner such that it is difficult to ascertain the impacts of the proposed rule or to effectively comment on many of the issues about which EPA has requested comment. Were a state to attempt to analyze the impacts of all potential regulatory scenarios possible under the proposed rule, the resource requirements would be intolerable. Such generally written proposals are unhelpful and make it virtually impossible for stakeholders to develop effective feedback to EPA. Future proposed rules should be more specific with regards to what will be required of state and regional air pollution regulatory agencies (SAPRAs) as well as what actions EPA expects to take.

Of particular concern in the proposed $PM_{2.5}$ Implementation Rule is generic, non-binding guidance provided regarding the requirements for precursor demonstrations. The proposed rule states, "In this proposal, the EPA is proposing that if a state is interested in developing a $PM_{2.5}$ precursor demonstration to support not regulating one or more $PM_{2.5}$ precursors in the attainment

plan for an area, it should consult with the EPA Regional Office as early as possible to discuss appropriate analyses to be included." While the AAQTF applauds EPA for attempting to provide some flexibility for SAPRAs to manage precursors in unique air sheds, such generic instruction will result in tremendous uncertainty on the part of states wishing to submit precursor demonstrations and inequitable application of the rule between regions and over time (i.e., as national and regional administrations change).

SAPRAs have not been given enough information to determine what they should include in a precursor demonstration. Among the possible requirements for a state to demonstrate that a precursor does not contribute significantly to $PM_{2.5}$ concentrations:

- Emissions inventory data is fairly standard and should be relatively easy for states to produce. However, with regards to ammonia and organic matter, which have heretofore been unregulated pollutants, emissions inventories for many states are highly uncertain, and EPA has used tenuous assumptions to "fill in gaps" where data are lacking. For example, in the 2011 National Emissions Inventory EPA:

    - Calculated concentrations of organic matter (OM) by multiplying measured organic carbon (OC) concentrations by a value of 1.6 rather than using measured data from EPA's Speciation Trends Network monitors. In developing emissions inventories, then, it is unclear whether states should follow EPA's lead by estimating OM concentrations based on OC concentrations or utilize speciation monitoring data collected in a given non-attainment area (USEPA, 2012).

    - Determined ammonia emissions from agriculture based on extremely limited data submitted by only a few states and tribes. For example, for any given category of nitrogen fertilizer, no more than nine states contributed fertilizer application data, and for some categories (e.g., aqueous ammonia), only two or three states reported fertilizer application data. EPA converted fertilizer applications to ammonia emissions using the Carnegie Mellon University (CMU) ammonia model, which fails to address several major factors influencing ammonia emissions, including application method and ambient and soil conditions at the time of application (USEPA, 2014).

      While EPA has concluded that fertilizer application constitutes over a fourth of the total ammonia emissions nationally, many states do not have reliable data for ammonia emissions from agricultural sources. In fact, "the lack of a method to estimate ammonia emissions from soil is probably the most significant information gap that exists for ammonia inventories in general" (Chinkin, 2003). Such a dearth of data will lead to inequitable regulation of agricultural sources of ammonia between states and EPA regional offices as regulated entities struggle to provide the required emissions inventory data for non-attainment areas.

    - Has made sweeping assumptions regarding ammonia emissions from animal agriculture. The NEI states, "Because of resource constraints at EPA, 2011 emissions are assumed to be the same as 2008 emissions" for EPA-developed

livestock waste emissions (USEPA, 2014). Such an assumption again shows the tremendous uncertainty that will be associated with ammonia emissions inventories in many states. EPA has exacerbated this issue by failing to publish guidance regarding methods for estimating ammonia emissions from animal agriculture years after the National Air Emissions Monitoring Study (NAEMS) project submitted data to the agency.

While EPA estimates that agricultural sources account for over 80 percent of national ammonia emissions, much of the data regarding emissions from agricultural sources are based on limited studies with small sample sizes that cannot be properly extrapolated to other sources. Such an issue will hamstring efforts to curb $PM_{2.5}$ concentrations by regulating precursors.

- While $PM_{2.5}$ inventory information has been documented for several years, EPA is now proposing to require emissions inventories in non-attainment areas to parse out condensable and filterable $PM_{2.5}$, which will require significant increases to monitoring resources, especially in areas where minimal or no PM speciation has been conducted. To confidently differentiate between condensable and filterable $PM_{2.5}$ emissions from either point or non-point sources will require significant monitoring campaigns that may be cost prohibitive. These costs to the states will be exacerbated by EPA's recent decision to move $PM_{2.5}$ monitoring funds from Section 103 authority (where matching funds are not needed) to Section 105 authority (where states will have to support a greater share of the costs for $PM_{2.5}$ monitoring) (NACAA, 2015).

  The Texas Commission on Environmental Quality (TCEQ) estimates that differentiating between condensable and filterable $PM_{2.5}$ under the current inventory will cost at least $150,000, and the benefit of such information within the context of the proposed rule is unclear. Furthermore, there is currently no federal requirement to differentiate between condensable and filterable $PM_{2.5}$ emissions in emissions inventories because there are not separate standards for these two constituents of $PM_{2.5}$. Currently, point sources report total $PM_{2.5}$ emissions to SAPRAs. An additional requirement for point sources to distinguish between condensable and filterable $PM_{2.5}$ will have significant cost implications for both regulated industries and regulatory agencies who must document and verify these new data.

- The photochemical modeling of secondary $PM_{2.5}$ formation (using CMAQ of CAMx) will likely require additional resources for states and will often require contracting with third-party consultants to perform such analyses. Such endeavors will require significant financial resources. For example, the TCEQ estimates that CMAQ or CAMx modeling for attainment demonstrations and Nonattainment New Source Review under the proposed implementation rule would require at least 1.5 FTE for approximately 6 months and would require an investment of ~$200,000 in increased computing capacity. The Louisiana Department of Environmental Quality (LDEQ) estimates that the required modeling, including source apportionment and sensitivity analyses, would cost, at a minimum, $150,000 per demonstration. LDEQ would have to use contractors as it does not have in-house modelers.

A similar approach of issuing generic guidance was taken by EPA when the agency issued the Exceptional Events Rule in 2007 (72 FR 13560). In that case, SAPRAs were encouraged to work with their EPA regional office to determine what analyses should be required in an exceptional events demonstration. The result has been inequitable regulation between regions, and those agencies that have submitted successful exceptional events demonstrations have spent hundreds of thousands of dollars to develop their application packages with little or no certainty that the application will be approved. EPA took years to issue guidance to clarify the requirements for exceptional events from windblown dust (which included unreasonable expectations for data availability such as 1-5 minute wind speed data, often in rural locations), and final guidance for developing applications for exceptional events resulting from wildfire are still pending. Such uncertainty in the requirements of SAPRAs is untenable and will make the hurdle for states wishing to make a precursor demonstration very challenging to clear.

As with an exceptional event demonstration, SAPRAs are likely to have one attempt to make the case to a regional office that a given precursor or set of precursors do not contribute significantly to concentrations of $PM_{2.5}$ in a given non-attainment area. Without clearer guidance from EPA regarding the requirements for such a demonstration than is given in the proposed rule, SAPRAs may tacitly be expected (or believe they are required) to allocate enormous resources to improve chances of a precursor demonstration being accepted when a lower level of resource allocation may be more appropriate.

Recommendation: The USDA AAQTF recommends that EPA provide clear guidance in the final rule regarding the required contents of a precursor demonstration. These requirements should reflect data analyses that are reasonably achievable by most states and may still be written to allow regulatory flexibility for unique air sheds while minimizing uncertainties associated with what analyses must be conducted to improve the probability of a favorable review by EPA.

Precursors to $PM_{2.5}$

Demonstrating Contributions to $PM_{2.5}$ Concentrations

Under Title I, Part D, Subpart 4 of the Clean Air Act, precursors of $PM_{2.5}$ must be regulated in non-attainment areas except where the Administrator determines that one or more such precursors do not contribute significantly to concentrations of $PM_{2.5}$. In the proposed implementation rule, EPA offers three options for performing such a demonstration (80 FR 15340):

- Option 1 – Two independent analyses:
  (a) an attainment planning analysis demonstrating that control measures for a particular precursor are not needed for expeditious attainment, meaning that the precursor can be excluded from measures needed to attain as expeditiously as practicable for all types of sources; and
  (b) a section 189(e) technical demonstration showing that major stationary sources of a particular precursor do not contribute significantly to levels that exceed the

$PM_{2.5}$ standard, meaning that the precursor can be excluded from control requirements for major sources including Nonattainment New Source Review (NNSR) permitting;

- Option 2 – Single analysis demonstrating that all emissions of a particular precursor from within the area do not significantly contribute to $PM_{2.5}$ levels that exceed the standard, meaning that control requirements for emissions of the precursor from major stationary and area sources, as well as mobile sources, would not be required for expeditious attainment, control requirements for major sources, or for NNSR permitting;

- Option 3 – An attainment planning analysis demonstrating that control measures for all types of sources of a particular precursor are not needed for expeditious attainment also would be deemed to meet the section 189(e) technical demonstration requirement, meaning that the state would not need to regulate emissions of the particular precursor from major stationary sources under the NNSR permitting program or other control requirements for major stationary sources.

The USDA AAQTF supports adoption of all three options proposed by EPA. Providing such options allows SAPRAs the flexibility needed to address unique environmental conditions and arrays of emissions sources within each non-attainment area. The AAQTF is particularly supportive of the sensitivity analysis option described under Option 2B that allows a SAPRA to determine the sensitivity of $PM_{2.5}$ concentrations to various precursors. Such an analysis is critical to ensuring that mitigation resources are targeted to those sources that will have the greatest impact on $PM_{2.5}$ concentrations. For example, in many agricultural areas there are significant amounts of ammonium nitrate (NH_3NO_3) and/or ammonium sulfate (NH_3SO_4) in ambient $PM_{2.5}$ which could imply that control measures for ammonia would be required in these areas. However, in many of these areas (e.g., the Central Valley of California), ammonia control measures will do little to reduce $PM_{2.5}$ concentrations because NO_x and/or SO_x are the limiting pollutant(s) in atmospheric reactions leading to $PM_{2.5}$ formation (Ansari and Pandis, 1998; Li et al., 2013). The AAQTF encourages EPA to retain the option for SAPRAs to conduct sensitivity analyses in order to target mitigation resources most effectively, but the Task Force encourages EPA to:

1. Be more specific in the final rule with regards to the "burden of proof" required to demonstrate the sensitivity of $PM_{2.5}$ concentrations to concentrations a given precursor in a precursor demonstration, and

2. Ensure that the "burden of proof" required is reasonable with regards to the resources required to conduct such a demonstration.

Recommendation: The USDA AAQTF recommends that EPA retain in the final rule all three options proposed by the agency for performing a precursor demonstration. Promulgation of all three options will provide states with the greatest flexibility for tailoring a precursor demonstration to a given non-attainment area.

The Task Force is particularly supportive of the sensitivity analysis described in Option 2B to ensure most effective use of mitigation resources. The Task Force requests that EPA be more specific in the final rule with regards to the "burden of proof" required to make an effective precursor demonstration and requests that EPA ensure that such requirements are reasonable in terms of resource requirements to conduct such demonstrations.

Photochemical Modeling

Regional-scale photochemical modeling will be required to develop State Implementation Plans (SIPs) and $PM_{2.5}$ attainment plans. The photochemical modeling that will be required to conduct a precursor demonstration includes prediction of complex atmospheric chemical reactions that are affected not only by concentrations of chemical constituents in the ambient air but also by environmental factors such as temperature, solar radiation, and moisture and by boundary conditions, which can be dramatically impacted by trans-boundary pollutant transport. While both CAMx and CMAQ models are capable of modeling particulate chemistry, performance of the particulate chemistry models has not been adequately validated and refined. Baker et al. (2011) and Hu et al. (2010) reported that CMAQ did not adequately simulate elevated $PM_{2.5}$ concentrations under cool, humid, or stagnant conditions. Kelly et al. (2015) compared the performance of brute-force, decoupled direct method, and advanced plume treatment approaches to conducting sensitivity analyses for ozone and $PM_{2.5}$ and found disagreements among the methods when simulating $PM_{2.5}$ concentrations, especially during evening and night hours and when simulating NOx and ammonia source impacts on $PM_{2.5}$. Furthermore, Kelly et al. (2015) observed numerical instability when predicting impacts of nitrate sources, similar to those reported by Bhave et al. (2011).

Model validation is essential for ensuring that regulatory compliance efforts have the desired impact on $PM_{2.5}$ concentrations, but many states that will be affected by the proposed implementation rule are resource limited and will be unable to validate photochemical modeling results without additional sources of funding. Furthermore, validation will be difficult to perform in any given air shed in the absence of extensive $PM_{2.5}$ speciation data.

For Serious Nonattainment areas, EPA proposes to require that states perform a technical analysis including modeling of emissions in a base year and future year(s) which in order to identify sources of $PM_{2.5}$ and its precursors, quantify their emissions, and quantify their contributions to violations of the $PM_{2.5}$ NAAQS (80 FR 15426). While modeling impacts of Reasonably Available Control Measures (RACM) implementation is common practice, conducting the proposed source apportionment modeling is extremely costly, especially when incorporating atmospheric chemical reactions, and will pose a major challenge to resource-limited states.

Recommendation: The USDA AAQTF recommends that EPA prioritize validation and refinement of the particulate chemistry models of both CAMx and CMAQ using measured speciation data, which may require additional and extensive EPA-sponsored collection of such data. Furthermore, the Task Force recommends that EPA work with SAPRAs to develop clearly defined and mutually accepted protocols for determining appropriate boundary conditions for such modeling. Such efforts will greatly reduce the uncertainty

associated with development of a precursor demonstration application and will allow SAPRAs to more effectively allocate resources for reducing $PM_{2.5}$ concentrations.

The "Bright Line" Approach

Under Title I, Part D, Subpart 4 of the Clean Air Act, precursors of $PM_{2.5}$ need not be regulated where the Administrator determines that one or more such precursors do not contribute significantly to concentrations of $PM_{2.5}$. EPA has proposed two options, including:

1. A "no threshold" option in which SAPRAs and EPA would jointly decide which precursors should be included in regulations under a $PM_{2.5}$ attainment plan considering other information such as $PM_{2.5}$ composition in the non-attainment area and sources of $PM_{2.5}$ and precursors within the non-attainment area.

2. A "bright line" option in which any precursor that contributes to $PM_{2.5}$ concentrations in excess of the "bright line" (proposed as 3% of the $PM_{2.5}$ NAAQS) would automatically be assumed to require application of RACM in any $PM_{2.5}$ attainment plan.

Although the "no threshold" approach ostensibly offers SAPRAs more flexibility to work with EPA to determine what precursors contribute "significantly" to $PM_{2.5}$ concentrations, the uncertainty added to the process by failing to establish what *de minimus* contributions to PM concentrations are significant will add significantly to the burden required of SAPRAs to conduct a precursor demonstration. Such an approach will also further increase discrepancies between regions with regards to the "burden of proof" required in a precursor demonstration.

However, adoption of a "bright line" approach precludes the sensitivity analysis that is critical to effective regulation of $PM_{2.5}$ precursors. For this reason, an "augmented bright line" approach should be taken whereby a "bright line" is adopted to establish a clear threshold for the magnitude of **reductions in $PM_{2.5}$ concentrations** that must be realized via reductions in concentrations of a given precursor. With this "bright line" in emissions reductions, a **minimum sensitivity coefficient threshold** should be established to ensure that regulatory resources are not wasted reducing emissions of a precursor that will have little impact on $PM_{2.5}$ concentrations. Such an approach has the benefits of certainty associated with the "bright line" approach proposed by EPA while also incorporating the scientific (and common sense) principles inherent in conducting a sensitivity analysis to target emissions reductions where they can best protect the public health and welfare. This approach differs from EPA's proposed "bright line" approach in that it considers the ***reductions*** in $PM_{2.5}$ that could be achieved by reducing precursor concentrations rather than the mass of $PM_{2.5}$ to which a given precursor contributes.

Under the "augmented bright line" approach, the question of *de minimus* contributions to **reductions** in $PM_{2.5}$ in order to determine which precursors are significant is still applicable. As discussed by EPA in the proposed rule, *de minimus* contributions to PM concentrations that could be considered "significant" have varied for different applications (from 1% for determining if additional analyses are required to address cross state air pollution contributions under Section 110(a)(2)(D) of the Clean Air Act to 2% for assessing whether a source contributes significantly to violations of the annual PM_{10} NAAQS to 3.3% for assessing whether

a source contributes significantly to violations of the 24-hour PM_{10} NAAQS). As pointed out by EPA, the 1% threshold for analyzing impacts of cross-state impacts (under Section 110(a)(2)(D)) is a very different application than is being proposed in the present rule under Section 189(e). A threshold in the range of 3 to 5 percent achievable ***reduction in $PM_{2.5}$ concentrations*** is much more appropriate for determining which precursors contribute significantly to violations of $PM_{2.5}$ NAAQS in a given area and has legal precedence with regards to determining what sources contribute significantly to violations of NAAQS under Section 189(e) of the Clean Air Act.

Recommendation: The USDA AAQTF recommends that EPA adopt an "augmented bright line" approach that considers impacts of precursor regulation on *reductions* in $PM_{2.5}$ concentrations when determining which precursors contribute significantly to $PM_{2.5}$ concentrations in non-attainment areas. Such an approach would reduce the uncertainty associated with requirements for precursor demonstration while also considering the efficacy of RACM implementation. A threshold of 3 to 5% reduction in $PM_{2.5}$ concentrations by reducing precursor concentration is appropriate for determining which precursors should be considered for regulation, but a demonstration that $PM_{2.5}$ concentrations are *sensitive to reductions in concentrations of a given precursor* should also be required.

Control of $PM_{2.5}$ Precursors

Geographic Scope of Proposed Requirements

In the proposed rule, EPA proposes to limit requirements for more detailed emissions inventories to non-attainment areas as opposed to requiring the more detailed inventories for an entire state, as was required under the 2007 $PM_{2.5}$ Implementation Rule. The court decision remanding the implementation rule back to EPA only required reassessment of precursors within non-attainment areas, and the benefit of requiring such a detailed state-wide inventory is unclear. However, allowing SAPRAs to target resources on non-attainment areas rather than developing state-wide inventories for precursors that may not impact $PM_{2.5}$ formation in non-attainment areas will lead to greater efficacy for resources spent on mitigating $PM_{2.5}$ concentrations.

Recommendation: The USDA AAQTF supports EPA's approach for requiring detailed emissions inventories only within the boundaries of non-attainment areas.

Control of Emissions from Agricultural Sources

Under the proposed implementation rule, Serious Nonattainment areas will be required to achieve a 5 percent annual reduction in emissions of both direct $PM_{2.5}$ **and $PM_{2.5}$ precursors** (80 FR 15424). Even in these Serious Nonattainment areas, sensitivity analyses such as those described under Option 2B should be used to identify those precursors whose reduction would lead to significant reductions in $PM_{2.5}$ concentrations. Simply requiring reductions in concentrations of non-limiting reactants will not lead to the desired outcome of reduced $PM_{2.5}$ concentrations and will lead to misallocation of limited resources available to protect the public.

Furthermore, until there is a uniformly accepted manner in which to calculate ammonia emissions from animal feeding operations and crop fertilization that accounts for those factors that may affect emissions from such sources (i.e., a process-based approach rather than a flat "per head" or "per acre" emission factor), such a requirement can only be met by exporting agricultural production out of non-attainment areas, which would severely damage local economies.

Recommendation: The USDA AAQTF urges EPA to quickly issue guidance for public comment regarding means to calculate ammonia emissions from animal and crop production that includes process-based considerations. Without such guidance, estimates of ammonia emissions from agricultural sources will vary widely between states, and there will be no clear means for reducing agricultural contributions to $PM_{2.5}$ concentrations other than eliminating production capacity within non-attainment areas.

Conclusions

The EPA's proposed implementation rule for the $PM_{2.5}$ NAAQS carries significant implications for states having non-attainment areas for the $PM_{2.5}$ NAAQS. For these areas, it is critical that the requirements for developing precursor demonstrations be clear and certain. It is also important that mitigation resources target those pollutants and precursors that are expected to have a measurable impact on $PM_{2.5}$ concentrations. To achieve these ends, the USDA Agricultural Air Quality Task Force recommends that EPA:

- **Provide clear guidance in the final rule regarding the required contents of a precursor demonstration.** These requirements should reflect data analyses that are reasonably achievable by most states and may still be written to allow regulatory flexibility for unique air sheds while minimizing uncertainties associated with what analyses must be conducted to improve the probability of a favorable review by EPA.

- **Retain in the final rule all three options proposed by the agency for performing a precursor demonstration.** The Task Force is particularly supportive of the sensitivity analysis described in Option 2B to ensure most effective use of mitigation resources. The Task Force requests that EPA **be more specific in the final rule with regards to the "burden of proof" required to make an effective precursor demonstration** and requests that EPA ensure that such requirements are reasonable in terms of resource requirements to conduct such demonstrations.

- **Prioritize validation of the particulate chemistry models** of both CAMx and CMAQ using measured speciation data. Furthermore, the Task Force recommends that EPA work with SAPRAs to develop clearly defined and mutually accepted protocols for determining appropriate boundary conditions for such modeling. Such efforts will greatly reduce the uncertainty associated with development of a precursor demonstration application and will allow SAPRAs to more effectively allocate resources for reducing $PM_{2.5}$ concentrations.

- **Adopt an "augmented bright line" approach that considers impacts of precursor regulation on *reductions* in $PM_{2.5}$ concentrations when determining which precursors contribute significantly to $PM_{2.5}$ concentrations in non-attainment areas.** Such an approach would reduce the uncertainty associated with requirements for precursor demonstration while also considering the efficacy of RACM implementation. A threshold of 3 to 5% reduction in $PM_{2.5}$ concentrations by reducing precursor concentration is appropriate for determining which precursors should be considered for regulation, but a demonstration that $PM_{2.5}$ concentrations are *sensitive to reductions in concentrations of a given precursor* should also be required.

- **Require detailed emissions inventories only within the boundaries of non-attainment areas.**

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