Mid-Atlantic/Northeast Visibility Union
MANE-VU

Reducing Regional Haze for Improved Visibility and Health

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January 6, 2021

Margaret Earnest, MC206, State Implementation Plan Team
Air Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Attention: Project Number 2019-112-SIP-NR

RE: 2021 Regional Haze SIP Revision

Dear Ms. Earnest:

The Mid-Atlantic/Northeast Visibility Union (MANE-VU) appreciates the opportunity to comment on the Texas Commission on Environmental Quality's (TCEQ's) 2021 Regional Haze State Implementation Plan Proposal dated October 7, 2020 (hereinafter, the TCEQ Proposal). MANE-VU is the regional visibility planning organization of the air agencies in the Mid-Atlantic and Northeast, consisting of eleven states, two tribal nations, and the District of Columbia. It coordinates regional haze planning activities to help its members reduce visibility impairment at Class I areas in the MANE-VU region in furtherance of achieving the national visibility goals of EPA's Regional Haze Rule (RHR). To ensure that reasonable progress in visibility protection is made at its own Class I areas, and indeed all Class I areas throughout the U.S., MANE-VU offers the following comments on the TCEQ Proposal. The TCEQ Proposal is of interest to MANE-VU because Texas was identified by MANE-VU to significantly contribute to visibility impairment at Class I areas in the region. MANE-VU consulted with Texas and other states identified as "contributing" and Texas was included in the states receiving the MANE-VU Inter-RPO "Ask" for contributing states.[1] The TCEQ response and resolution to this Ask must be detailed in the TCEQ Proposal for review and action by EPA and Federal Land Managers (FLMs) prior to approval. There are several statements in the TCEQ Proposal that MANE-VU does not agree with, which are described in the sections below.

[1] *Statement of the Mid-Atlantic/Northeast Visibility Union (MANE-VU) States Concerning a Course of Action in Contributing States Located Upwind of MANE-VU Toward Assuring Reasonable Progress for the Second Regional Haze Implementation Period (2018-2028),* August 25, 2017. Available at https://otcair.org/MANEVU/Upload/Publication/Formal%20Actions/MANE-VU%20Inter-Regional%20Ask%20Final%208-25-2017.pdf

1. *3.4.4 MANE-VU Ask*

On page 3-3, TCEQ disagrees with MANE-VU's conclusion that emissions sources in Texas have the potential to contribute to visibility impairment at MANE-VU Class I areas such as Brigantine Wilderness Area in New Jersey and Moosehorn Wilderness Area in Maine. TCEQ also raised concerns about the approaches that MANE-VU took in determining which states to consult with regarding emissions reduction measures to ensure reasonable progress at MANE-VU Class I areas, particularly with the Q/d*C and CALPUFF methodologies.

According to EPA emission projections for 2023, Texas will be by far the largest emitter of SO_2 and NOx in the nation. The state's emissions are projected to be more than twice those of the second highest emitting state, California. Only Pennsylvania (#3) and New York (#14) represent MANE-VU in the top 20 emitting states. Thus, on the surface, it is not surprising that transport of haze precursors from beyond the MANE-VU border is a problem that MANE-VU seeks to address.

EPA's 2019 *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period* [2] (hereinafter, *EPA's 2019 RH Guidance*) states that "A variety of technical, quantitative approaches exist to assess which out-of-state Class I areas may be affected by aggregate emissions from a given state" and "a state may use another reasonable approach (e.g., back trajectory-based approaches)." MANE-VU used CALPUFF as a screening tool in addition to other methods in line with EPA guidance. CALPUFF and emissions over distance by wind direction constant (Q/d*C), as all models, have limitations. However, MANE-VU took a weight of evidence approach by using several analyses plus altering traditional methods to account for known uncertainties to select top contributors. Further, in agreement with FLM and EPA input, the MANE-VU Ask took the approach of simply identifying emission sources and requesting that the affected states further assess them by 4-factor analysis. The final decision regarding the need to apply emission reductions resides with the states. MANE-VU expects that this request should target a subset of the analyses already being performed by TCEQ according to EPA guidance documents.

MANE-VU HYSPLIT analyses, in addition to the aforementioned analyses, provided MANE-VU with additional credence in the selection of contributing states. In addition, during the first planning period, MANE-VU used resource-intensive photochemical modeling, a tool currently recommended by EPA and FLMs, and the results did not vary significantly from the results of the current MANE-VU analyses.

One study referenced in comments received by MANE-VU regarding the uncertainties associated with long-range CALPUFF transport simulations was the *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling*

[2] U.S. EPA, *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*, August 20, 2019. Available at https://www.epa.gov/sites/production/files/2019-08/documents/8-20-2019_-_regional_haze_guidance_final_guidance.pdf.

Long Range Transport Impacts.[3] The study finds that uncertainty in the model is driven by the characterization or mixing depth and the transport winds. These conclusions were derived with CALPUFF and CALMET version 5.0. To account for the noted uncertainty, MANE-VU used several methods, several meteorological years, and a more recent version of CALPUFF, 7.2.1, to include model refinements and a relative ranking of quantitative results in selecting contributing states. Several Q/d runs were utilized to evaluate the ranking of contributing states. Despite the varying methodologies, there was little difference in the states identified as the top contributors. Therefore, TCEQ's concern about MANE-VU's inclusion of statewide emissions did not alter the resulting conclusion in the selection of states, but rather added additional information to evaluate in a weight of evidence manner.

The MANE-VU Q/d analyses used the more advanced technique that accounts for wind vector frequency. A "C" factor was derived for specific wind vectors unique to each Class I area receptor and applied to each Q/d calculation. The analyses also account for the conversion of sulfur dioxide to the sulfate portion of the fine particulates and is unique to each wind vector for each Class I area and, therefore, accounts for some of the uncertainty with residence times, wind vectors, and secondary particle formation.

CAMx, like all models, also has limitations. CAMx has model performance issues for ammonium nitrate concentrations that are critical to regional haze. In addition, CAMx typically considers only one year of meteorology. There can be considerable variation in transport patterns from year to year. Therefore, MANE-VU included additional meteorological analyses to address this variation. The MANE-VU CALPUFF simulations were done with three sets of meteorology: 2002, 2011 and 2015, which provided the ability to establish a relative ranking with less uncertainty. For screening purposes, this analysis purposely identified the maximum potential 24-hour impact with these three years of data. This is significantly different from common CAMx and CMAQ modeling techniques that average contribution for a single year over the top 20 percent days. Had MANE-VU relied on the CAMx/CMAQ modeling technique, lower thresholds certainly would have been applied. Furthermore, to recognize the fact that each of these methods bore their own uncertainties, MANE-VU did not utilize the results for the absolute value of contribution but rather the relative ranking between states, to determine the top contributing states for consultation. Therefore, the concern regarding an over-estimation of contribution values is not relevant to the application of these results.

It is also important to note that during the first round of SIP regional haze planning, MANE-VU included several other methods to identify contributing states; all of the methods concurred that the top contributing states would appear in the same relative order of ranking. The first round of regional haze planning showed that the more resource-intensive photochemical modeling would not necessarily change the relative ranking within the top contributing states. Therefore, because this second regional haze planning period is more resource-restricted than the previous one, MANE-VU moved forward as resources allowed and was careful to recognize the uncertainties of each tool utilized. MANE-VU also notes that regardless of the model chosen, uncertainties will exist, and it is up to the interpreter to note those uncertainties and use due diligence to

[3] U.S. EPA, *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts*, EPA OAQPS, EPA-454/R-98-019 (December 1998).

implement methods that help clarify or reduce those uncertainties. Through the inclusion of the varied methodologies and the treatment of the results for qualitative rankings, these uncertainties were adequately addressed for the resources and objectives at hand. Please note that Texas was not a borderline contributor to MANE-VU Class I areas according to any of these analyses. In fact, Texas ranked 9th in terms of maximum mass-weighted sulfate and nitrate contribution at any given MANE-VU Class I area.[4]

MANE-VU also coordinated with its members to identify a set of Inter-RPO Asks for the upwind contributory states that were deemed necessary to achieve reasonable progress in visibility improvement at MANE-VU Class I areas. The MANE-VU Inter-RPO Asks were discussed with the upwind contributing states as part of the Regional Haze Consultation Process, in which Texas participated. In accordance with RHR § 51.308(f)(2)(ii)(A), "The State must demonstrate that it has included in its implementation plan all measures agreed to during state-to-state consultations or a regional planning process, or measures that will provide equivalent visibility improvement." To this end, TCEQ should implement the measures in the MANE-VU Inter-RPO Ask,[5] or equivalent measures, to reduce emissions from sulfates and nitrates and improve visibility at Brigantine Wilderness Area, Moosehorn Wilderness Area and all the other Class I areas impacted by emissions from Texas. Further, RHR § 51.208(f)(2)(ii)(C) states, "In any situation in which a State cannot agree with another State on the emission reduction measures necessary to make reasonable progress in a Mandatory Class I Federal area, the State must describe the actions taken to resolve the disagreement." If TCEQ elects not to implement the MANE-VU Inter-RPO Ask, then TCEQ should include in its SIP the specific actions, such as the adoption of equivalent emission reduction measures, that it proposes to take to resolve TCEQ's disagreement with MANE-VU's assertion that TCEQ's implementation of the measures in the MANE-VU Inter-RPO Ask are necessary to make reasonable progress at certain Class I areas in the MANE-VU region.

2. *6.7 Emissions Summaries and 6.8 NOx and SO_2 Emissions Trends*

After reviewing the emissions summaries and trends in these two sections, MANE-VU offers the following observations:

- From 2011-2017, **anthropogenic** area source emissions of NOx and SO_2 have increased.
- From 2011-2017, area source emissions of $PM_{2.5}$, PM_{10}, and NH_3 have increased.
- From 2011-2017, EGU emissions of NH_3 and $PM_{2.5}$have increased.
- From 2011-2017, on-road mobile source emissions of SO_2 and PM_{10} have increased.
- From 2011-2017, NH_3 non-EGU point source emissions increased.
- On an average June day in Texas, the non-EGU sector is projected to have increased emissions for all pollutants, except SO_2, between 2016 and 2028.
- VOC emissions from EGUs are projected to increase in every season of 2028 compared to 2016.
- NH_3 emissions from non-road sources are projected to increase every season of 2028 compared to 2016.

[4] Please see Table 7 of the *Selection of States for MANE-VU Regional Consultation* document (https://otcair.org/MANEVU/Upload/Publication/Reports/MANE-VU%20Contributing%20State%20Analysis%20Final.pdf).
[5] See footnote 1.

- Wintertime NOx emissions from EGUs are projected to increase over the second implementation period. MANE-VU has identified this as an issue in its Class I areas and Texas contributes approximately 5% of impairment to each of the MANE-VU areas.[6]
- Locomotive emissions from all pollutants and seasons are projected to increase from 2016-2028.
- Airport emissions for all seasons and pollutants are predicted to increase between 2016 and 2028, except NH_3.
- Area source emissions of VOC, $PM_{2.5}$, and PM_{10} are predicted to increase over all seasons between 2016 and 2028, with NH_3 increasing slightly in the spring.

Given the increasing trends in emissions from these sectors and importance of making incremental progress towards the RHR goal of natural visibility conditions by 2064, TCEQ should consider additional control measures for the above-listed emissions sectors.

3. *7.2.2.3 Results of Four-Factor Analysis*

On page 7-16, TCEQ did not consider it reasonable to implement additional control measures for reasonable progress during this planning period because of the relatively low maximum individual visibility benefit of 0.56 deciview at the Caney Creek Class I area. Although TCEQ is correct that EPA's *2019 RH Guidance* allows for the consideration of visibility in determining whether emissions control measures are necessary for making reasonable progress, the guidance also states that "because regional haze results from a multitude of sources over a broad geographic area, a measure may be necessary for reasonable progress even if that measure in isolation does not result in perceptible visibility improvement." Widespread emissions controls, particularly for SO_2 and NOx, are essential for making reasonable progress at Class I areas both near to, and more distant from, emissions sources. Further, small visibility improvements, even those that may be imperceptible, are essential for making progress towards the RHR goal of restoring natural conditions at Class I areas by 2064. Therefore, TCEQ should reconsider for implementation the emissions control measures and associated costs that it evaluated in performing its four-factor analyses.

4. *Appendix A-5 MANE-VU Consultation*

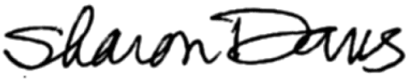
In Section 1 of this appendix, TCEQ notes that all MANE-VU Class I areas are below their respective Uniform Rate of Progress (URP glide path). While this is true, being under the level of the URP glide path is not a "safe harbor." States whose emissions affect visibility at Class I areas within or outside their state must consider emissions reduction measures such that reasonable progress is made towards the RHR goal of natural visibility conditions at Class I areas by 2064. The members of MANE-VU are moving forward with implementing reasonable measures in their second round of Regional Haze SIPs to achieve visibility improvement by 2028. As required by the RHR, MANE-VU coordinated with the upwind contributory states for the same reasons. Therefore, TCEQ should reconsider for implementation the emissions control measures and associated costs that it evaluated in performing its four-factor analyses.

[6] Between 4.7 and 6.3 percent mass-weighted sulfate and nitrate contribution for each of the MANE-VU Class I areas comes from Texas according to Table 7 of the *Selection of States for MANE-VU Regional Consultation* document (https://otcair.org/MANEVU/Upload/Publication/Reports/MANE-VU%20Contributing%20State%20Analysis%20Final.pdf).

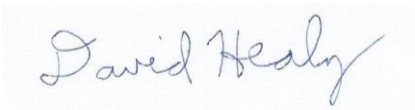
Referring to Section 5 of this appendix, the TCEQ Proposal should include further documentation to ensure that facility shutdowns such as those shown in the Section 5 table and those described in Section 7.6.3.8 of the TCEQ Proposal are permanent and enforceable.

Thank you for your consideration of these comments. Please do not hesitate to contact us by email at Sharon.Davis@dep.nj.gov and David.S.Healy@des.nh.gov if you have specific questions regarding the content of this letter.

Sincerely,
Co-Chairs, MANE-VU Technical Support Committee



Sharon Davis, New Jersey Department of Environmental Protection



David Healy, New Hampshire Department of Environmental Services

cc: MANE-VU Directors
MANE-VU Technical Support Committee