APPENDIX W

New Hampshire Regional Haze Plan Periodic Comprehensive Revision
COMPILATION OF PUBLIC COMMENTS AND NEW HAMPSHIRE'S RESPONSES THERETO (2021-2022)

Comments were received from:

- *EPA submitted comments in letters dated August 3, 2021 and February 25, 2022.*
- *FLMs submitted comments in email dated June 11, 2021 and a letter dated June 16, 2021.*
- *The North Carolina Division of Air Quality (NCDAQ) submitted comments in a letter dated February 23, 2022.*
- *The Virginia Department of Environmental Quality (VADEQ) submitted comments in a letter dated February 23, 2022.*
- *The Sierra Club (SC), Appalachian Mountain Club (AMC), National Parks Conservation Association (NPCA), and Conservation Law Foundation (CLF) provided comments in a letter dated February 24, 2022.*

These comments will be addressed in the sections below. The full text of all comments received can be found in Appendix W.

EPA Comments on New Hampshire's April 19, 2021 draft New Hampshire Regional Haze Plan Periodic Comprehensive Revision Received August 3, 2021

EPA Comment 1: While MANE-VU provided the technical analyses for the development of the Regional Haze Plans, New Hampshire's narrative should reflect how its decision making during the development of the plan culminated in a SIP submission that meets the requirements of the regional haze program, 40 C.F.R. Section 308(f) and (g), to improve visibility at the New Hampshire Class I areas. Our comments below provide detailed feedback on the SIP, and we emphasize several central points in this first General Comment.

New Hampshire relies heavily on MANE-VU's Asks to satisfy its regional haze requirements. EPA greatly appreciates New Hampshire's collaboration with its nearby states through MANE- VU. However, New Hampshire has an independent obligation to satisfy the regulatory requirements relating to (among other things) source selection, four-factor analyses, and development of a long-term strategy that makes reasonable progress. New Hampshire's draft SIP provides little explanation as to how satisfying MANE-VU's Asks is consistent with these legal requirements. Similarly, the State provides almost no explanation of whether its choices are consistent with EPA's August 2019 Policy Guidance, and if not, why the State has chosen a different approach. We encourage the State to justify its approach, including its decision to address MANE-VU's Asks, based on the statutory and regulatory requirements, as well as with EPA's guidance.

Specifically, we encourage the State to clearly explain and justify its criteria for source selection for four-factor analysis. As an initial matter, it is unclear whether the State's criteria is 3 inverse megameters, 1 inverse megameter, or something else. Moreover, regardless of which criteria the State is adopting, the State offers very little justification as to why that criteria is appropriate. We encourage New Hampshire to carefully review the source selection portions of the 2019 Guidance and the recently issued 2021 Clarifications Memorandum and set forth explanations for source selection that are consistent with that guidance and the underlying statutory and regulatory requirements.

Notwithstanding this lack of explanation, EPA appreciates and commends New Hampshire's evaluation of numerous in-state sources. Robust evaluation of a reasonable set of in-state sources is central to an approvable regional haze SIP. Even if New Hampshire determines that no new measures are necessary at selected sources, the State must nonetheless still assess whether existing measures are necessary for reasonable progress. If they are necessary to make reasonable progress, those measures must be incorporated into the regulatory portion of the SIP, unless they are already incorporated therein. As EPA explained in the 2021 Clarifications Memorandum,

existing measures are generally necessary for reasonable progress, but a statemay make a weight-of-evidence demonstration that such measures are not necessary. We recommend that New Hampshire follow the approach outlined in the Clarifications Memorandum in determining whether existing measures are necessary to make reasonable progress.

Finally, we commend the work New Hampshire has already done, including its notable progress toward preventing and remedying regional haze over the past two decades, and its collaboration with MANE-VU, nearby States, and in-state sources. However, we emphasize an approvable regional haze SIP is one that adequately addresses the statutory and regulatory requirements. We recommend that New Hampshire thoroughly justify its choices based on those legal requirements as well as EPA's guidance, especially with regard to the points noted above and throughout this comment letter.

NHDES Response: NHDES appreciates EPA's recognition of the significant efforts made and progress achieved in the pursuit of improved visibility at regional Class I Areas as well as throughout New Hampshire. New Hampshire is a small state with limited resources for completing significant undertaking such as the Regional Haze Rule, and as a result relies heavily on regional collaborative work. Because air pollution does not respect jurisdictional boundaries, it is important to have EPA and the FLMs as partners, whose reach expands nationwide. For this reason, NHDES and MANE-VU actively involved EPA and the FLMs in all regional technical analyses and decision making throughout the process. This collaborative work formed the foundation of the decisions made in this Regional Haze SIP. Further, NHDES agrees that its Regional Haze SIP must meet the legal requirements of the Regional Haze Rule and EPA's August 2019 Policy Guidance.

The MANE-VU "Ask" served as a guide for NHDES for focusing on what minimum requirements that New Hampshire would expect contributing states to address in their SIPs. Since New Hampshire is itself considered a contributing state, we held ourselves accountable for addressing the MANE-VU "Ask" in our SIP.

Section 4.2.1 contains revised language to document NH's source selection as required in section 51.308(f)(2)(i) and further elaborated in the 2019 guidance.

NHDES has added Table 1-1 in Section 1.2.4 to better clarify where the specific elements of the Regional Haze Rule and EPA's 2019 guidance memo requirements can be found in the NH SIP. In addition, clarification language throughout the SIP document has been added to link each section to the legal requirements. Further explanation is provided below.

Section 4.2 has been revised to better explain the source selection process and development of the long-term strategy. In short, MANE-VU included emission sources with CAMD records for actual NOx and SO_2 emissions over a 2-year period (2011 and 2015) and used the 95th percentile of the maximum hourly 2015 emissions as the most recent information available at the time for use in developing the "Ask".

Appendix C[1] of the NH Regional Haze SIP documents the MANE-VU screening modeling process for individual sources. MANE-VU received numerous comments, including from EPA and FLMs that the model being used should only be applied as a screening tool due to performance questions and the model's tendency to be overly conservative (or overly restrictive from the upwind state perspective). Thus, MANE-VU decided that any thresholds from this modeling would be used to request a base level of additional analysis from contributing emission areas.

The modeling analyses demonstrated that at each MANE-VU regional Class I Area, that a relatively small number of emission sources dominated the results. Through consultation, it was decided to "Ask" for

[1] MANE-VU, (April 2017). *2016 MANE-VU Source Contribution Modeling Report, CALPUFF Modeling of Large Electrical Generating Units and Industrial Sources*. Appendix C.

additional analyses from those emission sources that were relatively few in number but had the most impact for MANE-VU benefit and allow individual states to decide which additional sources needed evaluation. For the purpose of developing the MANE-VU "Ask" of contributing states, a screening threshold of 3 Mm^{-1} was used for these large point sources. After further review and consultation, a tighter screening threshold of 1 Mm^{-1} was applied to subsequent analyses of NH's emission sources.

NHDES appreciates the recognition for the extensive analyses of a large number of in-state emission sources and that we did not limit ourselves to the visibility thresholds included in the MANE-VU "Ask." Beyond the NH point emission sources addressed in the NH SIP, NH has adopted non-direct emission reduction measures such as low sulfur fuel oil standards, and a number of energy conservation measures. All of the federally enforceable measures incorporated into the NH Long Term Strategy (LTS) in order to meet Reasonable Progress Goals (RPGs) are outlined in Section 4.2.10 of the SIP.

EPA Comment 2: Page 23 – NH considered a contribution threshold of 2% of sulfate plus nitrate contribution to determine that emissions from NH contribute to Acadia, Moosehorn, and Great Gulf. There are additional Class I areas with contributions from NH emissions of >1% that should also be considered (Brigantine and Lye Brook). The statutory language "may reasonably be anticipated to cause or contribute" (169A(b)(2)) and the regional haze rule language "may be affected by emissions from the State" (51.308(f)(2)) are very low bars, i.e., it is very difficult to demonstrate that emissions from a state do not cause or contribute to visibility impairment in a nearby Class I area. We note, moreover, that it appears that NH has already consulted with Vermont and New Jersey (where Lye Brook and Brigantine are located, respectively) through the MANE-VU consultation process and has considered the impacts of its sources on those Class I areas, see, e.g., Table 2-6. Thus, it is unclear why the State has nonetheless chosen a relatively high 2% threshold. We recommend that the chosen threshold of 2% should be further justified.

NHDES Response: The rationale for the 2% threshold is provided on page 49 of the MANE-VU Consultation Report[2]. The MANE-VU and NHDES 2% threshold is double the EPA's 1% threshold for determining whether an upwind state contributes to NAAQS nonattainment in a downwind state. Given the conservative nature (i.e. the tendency to over-predict) in the analyses that MANE-VU and NHDES used to select contributing states, and given the uncertainty associated with adapting a NAAQS contribution threshold to a threshold for visibility impairment, MANE-VU and NHDES chose a slightly higher 2% threshold to avoid including states that are not reasonably anticipated to contribute to visibility impairment at a MANE-VU Class I area. MANE-VU and NHDES's chosen 2% threshold yielded a robust list of states, including New Hampshire itself, that were deemed reasonably likely to contribute to visibility at one or more of MANE-VU's Class I areas.

Since NH and all other MANE-VU states are considered contributing states to Class I states within MANE-VU, NHDES held itself to the 2% threshold based on consultation with and acceptance of this approach during the regional haze process. The modeling contained in Appendix C provides significant detail for contributions of several NH emission sources to each one of the seven MANE-VU Class I Areas, plus an additional four Class I Areas in the VISTAS/SESARM region. NHDES also performed its own modeling for additional NH emission units for each of the same eleven Class I Areas.

EPA Comment 3: Page 30 – "In the resolution, the Class I states agreed to set reasonable progress goals for 2018…" should be revised to 2028.

NHDES Response: NHDES agrees with this comment and corrected the date in the SIP.

EPA Comment 4: Page 31 – "Further, New Hampshire depends on EPA and the FLMs to fulfill the Ask requested of them and to ensure the MANE-VU Asks are adequately addressed in the SIPs of all contributing states." It is unclear what New Hampshire means by "adequately addressed."

[2] MANE-VU TSC, (July 2018). *MANE-VU Regional Haze Consultation Report*. Appendix G.

NHDES Response: In general, "addressing" a MANE-VU "Ask" means that a state has done the requisite analyses to determine whether the requested "Ask" element is reasonable to implement for the applicable source or source category.

EPA Comment 5: Page 33 – The last paragraph should be revised to read: "Natural visibility conditions refer to the visibility conditions that existed before human activities affected air quality in the region. Consistent with the stated visibility goals of the Clean Air Act, natural visibility conditions is identified as the visibility target to be reached in each Federal Class I area."

NHDES Response: The requested revision was made to the SIP.

EPA Comment 6: Page 37 – "Class I states must have information that will be considered by contributing states so that during the interstate consultation process, they can make reasonable asks for controls to be implemented. To achieve these two ends, the MANE-VU Four-Factor/Contribution Assessment Workgroup, a subset of the Technical Support Committee, collected the information and summarized it in a memo." New Hampshire should include in its implementation plan a discussion of how the four statutory factors were considered in developing the "Asks," as required by 40 CFR 51.308(f)(2)(i).

NHDES Response: Section 4.2 was revised to include a discussion of the role of the four statutory factors in the developing the MANE-VU "Asks."

EPA Comment 7: Page 40 – The text indicates that New Hampshire ICI boilers contributing to 50% of the impairment at a MANE-VU Class I area include: Dartmouth College and Gorham Paper & Tissue LLC. New Hampshire's contribution assessment was based on 2011 emissions. If a state uses a value for emissions in an earlier year such as 2011, we recommend the state consider whether emissions have appreciably changed (or will change) between the earlier year, a more recent time period, and the projected future year (2028). In addition, the regional haze rule specifically requires evaluation of emissions information from 2017 or a more recent year (51.308(f)(2)(iii)).[3] It is especially important to consider whether source emissions have increased or are likely to increase between 2011, a recent time period (i.e., 2017 or a later year), and in 2028. 2019 Guidance at 17.

NHDES Response: We appreciate the recognition that economic forces have led to emission changes since the year 2011 which was used for ICI boilers in the MANE-VU Modeling analysis. Significant effort was made to perform this modeling and create the necessary data set, especially since hourly emissions are not regularly available for most of these units. At the time, MANE-VU had access to well-vetted emissions created for its regional modeling platform based on the year 2011. Work on this screening analysis began before emissions data for more recent years, such as 2017 and 2020, was available. While projected emissions to a more recent year would have been helpful, the standard for projecting these units in regional modeling is to apply a zero-percent growth factor. Thus the 2011 emissions were the most recent MANE-VU had for this modeling effort to cover the most critical portions of the modeling domain. Because NHDES has access to updated permitted emissions for in-state units, these emission sources were revisited. In most cases where updated emission data was available, emissions declined since 2011.

For Dartmouth College and Gorham Paper & Tissue specifically, the tables below show 2011 emissions compared with emissions from more recent years (2017 and 2020), for which data have now become available. The tables show an overall downward trend in emissions, particularly for SO_2 at Gorham Paper & Tissue since two boilers at the facility were converted to be able to burn natural gas after 2011.

[3] "The emissions information must include, but need not be limited to, information on emissions in a year at least as recent as the most recent year for which the State has submitted emission inventory information to the Administrator in compliance with the triennial reporting requirements of subpart A of this part."

Dartmouth College Reported SO_2 and NOx Emissions for 2011, 2017, and 2020 (Tons per Year)

Pollutant	2011	2017	2020
SO_2	308.9	223.3	126.1
NOx	113.2	82.9	74.0

Gorham Paper & Tissue Reported SO_2 and NOx Emissions for 2011, 2017, and 2020 (Tons per Year)

Pollutant	2011	2017	2020
SO_2	127.0	15.2	2.7
NOx	42.8	55.6	40.3

Note: After 2011, Gorham P&T converted two of its boilers to be able to burn natural gas.

As discussed in Section 4.2.7 of NH's SIP, NHDES relied on modeling performed by the OTC Modeling Committee and MANE-VU to fulfill the technical basis requirement of 51.308(f)(2)(iii). The specific modeling that was used to establish NH's RPGs was based on a projected inventory year of 2028. Acknowledging that 51.308(g)(4) is a separate requirement than 51.308(f)(2)(iii), NHDES has provided an extensive analysis of emissions trends in NH, the MANE-VU region, and contributing states. This analysis can be found in Section 5.4 of the SIP and is intended to fulfill the requirements of 51.308(g)(4). This analysis incorporates data through 2017 and shows that emissions have trended downward for virtually all visibility impairing pollutants. NHDES fully expects these downward trends to continue into the near future due to the multitude of state and Federal programs to control emissions for not only visibility protection goals, but for NAAQS attainment and maintenance, control of acid rain, and the reduction of air toxics.

EPA Comment 8: Also on page 40, the SIP states, without further elaboration, that the number of sources was limited to those that cumulatively contributed to 50% of the impairment. Please explain why this threshold was chosen and why it is reasonable.

NHDES Response: Cumulative contribution of 50% of visibility impairment was erroneously mentioned in the draft SIP. This has been corrected in Section 4.2.2.

EPA Comment 9: Page 43 – The MANE-VU "Ask" - As a MANE-VU State with a Class I area, New Hampshire should provide the four-factor analyses that New Hampshire considered to develop the "Asks," both individually and collectively. New Hampshire should also explain what it means to "meet" a MANE-VU Ask and how "meeting" the Asks relates to making reasonable progress. Are "meeting" an Ask and "addressing" an Ask mean the same thing? Further, if New Hampshire completes (or adopts) a four-factor analysis to "meet" an Ask and concludes that no additional controls are necessary, New Hampshire should clarify how such a conclusion relates to reasonable progress.

NHDES Response: Please see the response to EPA's Comment 6 above re: Page 37. The four-factor analyses for the individual and collective "Asks" were previously developed with an effort led by MARAMA and its contractor.

In general, "addressing" a MANE-VU "Ask" means that a state has done the requisite analyses to determine whether the requested "Ask" element is reasonable to implement for the applicable source or source category. "Meeting" a MANE-VU "Ask" means the following: 1) A contributing state has adopted the requested "Ask" element into its SIP as an enforceable measure necessary to make reasonable progress[4], or 2) the contributing state has made a robust demonstration that it is not reasonable to adopt the requested "Ask" element and thereby "disagrees" with MANE-VU (and by extension, NHDES) on that "Ask" element. If a contributing state selects option 2, then it is especially

[4] It should be noted that not all of MANE-VU's Ask items involve enforceable measures. In particular, Item 6 of the Intra-RPO Ask and Item 5 of the Inter-RPO Ask simply request that states consider and report in their SIPs on energy efficiency, CHP, and DG programs.

important that EPA and the FLMs fulfill MANE-VU's (and NHDES's) "Ask" of them that they provide the necessary review and comment to ensure that the contributing state has provided an adequate and robust justification that the requested "Ask" item is indeed not reasonable to implement.

The manner in which New Hampshire "meets" the MANE-VU "Ask" and its individual elements is described in detail in Section 5.4 of the SIP. Just about all of NHDES's identified sources are already very well controlled for visibility impairing pollutants and are reviewed in detail in the SIP. All of the existing emissions control measures described in Section 4.2.8 and 4.2.9, including NH's adoption of an ultra-low sulfur fuel standard and site-specific enforceable emission limits are deemed by NHDES as being necessary to make reasonable progress.

EPA Comment 10: Page 48 – Typo in "4.2.6 Technical Basis for MANE-VU "Ask""

NHDES Response: The revision was made to the SIP.

EPA Comment 11: Page 51 – "MANE-VU predicts 2028 RPGs of 12.00 dv with the MANE-VU "Ask" and 12.13 dv without." There is some uncertainty in the number, but NH should pick one. It is probably better to not assume that the upwind states will do all of the MANE-VU Asks and therefore use the 12.13 dv number.

NHDES Response: The modeled value of 12.13 dv is the official number for the NH Regional Haze SIP. NHDES included the additional results in recognition of what the state anticipates is possible for visibility improvement if all states identified as contribution fully implemented the measures included in the MANE-VU "Ask."

EPA Comment 12: Page 52 – Section 4.5 Meeting the "Ask" – New Hampshire, this section should be moved up to be with the LTS section or right after. It is confusing to put this *after* the RPG section.

NHDES Response: This section was moved into the Long-Term Strategy section as Section 4.2.9.

EPA Comment 13: Page 54 & throughout – in various instances in the draft SIP, NHDES made the determination that "no further limitations as a result of MANE-VU "Ask [#1]" are required of this source. NH DES should provide the enforceable mechanism in the Appendix for easy reference.

NHDES Response: Enforceable mechanisms are included in the Appendix and are referenced within the SIP.

EPA Comment 14: More generally, all of the measures (whether new or existing) necessary for reasonable progress must be clearly identified as part of New Hampshire's long-term strategy and incorporated into the regulatory portion of the SIP. We note that the current long-term strategy section contains a lengthy discussion of various state and federal requirements, and it is not clear to EPA which of those is actually part of the long-term strategy and which of those are simply other requirements related to NOx and SO_2. The State should more clearly identify what is actually part of its long-term strategy.

NHDES Response: The Long-Term Strategy section of the SIP, specifically Section 4.2.10, describes the federally enforceable mechanisms that are necessary for reasonable progress. Measures for the second implementation period include: use of lower sulfur fuels, reduced NOx limits for specific industries, and more stringent NOx limits at the Stored Solar Tamworth biomass EGU.

EPA Comment 15: For Ask-2, New Hampshire should provide the rationale for selecting the 3.0 Mm^{-1} screening threshold. New Hampshire should also explain how the MANE-VU threshold is consistent with making reasonable progress. It is not enough to merely reference the MANE-VU 3.0 Mm^{-1} threshold without explaining why a four-factor analysis was not conducted for additional large sources within the state.

NHDES Response: 3.0 Mm^{-1} was the MANE-VU screening threshold for the purposes of developing a minimum acceptable standard for emission unit analysis, or in this case, a four-factor analysis. NHDES adopted a lower threshold of 1.0 Mm^{-1} which expanded analysis to include a larger number of in-state sources. In addition, some units underwent extra analyses at the request of FLMs during consultation (see Table 2-6 of the SIP). Refer to Section 4.2.1 of the SIP which outlines the list of sources evaluated.

EPA Comment 16: As noted in the Clarifications Memo at Page 3[5], "In applying a source selection methodology, states should focus on the in-state contribution to visibility impairment and not decline to select sources based on the fact that there are larger out-of-state contributors. What is reasonable will depend on the specific circumstances. We generally think that a threshold that captures only a small portion of a state's contribution to visibility impairment in Class I areas is more likely to be unreasonable. Similarly, a threshold that excludes a state's largest visibility impairing sources from selection is more likely to be unreasonable."

NHDES Response: As mentioned in response to the comment above, NHDES did identify New Hampshire sources including smaller emitting units in NH based on a lower threshold of 1.0 Mm^{-1} as well as at the request of the FLMs during consultation. As outlined in Section 4.2.2, many of these sources were evaluated as part of NH's implementation of the "Intra-RPO Ask" which were in and of themselves developed based on a four-factor analysis evaluation of source categories as determined by MANE-VU based on an outside contractor's review. NHDES applies a full-depth four-factor analysis for the units owned and operated by Granite Shore Power which had some of the highest predicted visibility impacts and were specifically identified in the "Intra-RPO Ask". It should be noted that NHDES worked with the FLMs during the consultation period to provide additional data and analyses for a number of NH emission sources. The results of this work are reflected in the current SIP. MANE-VU's and NHDES's technical analyses and associated thresholds captured a robust set of sources from within New Hampshire that NHDES selected for further analysis.

EPA Comment 17: On the bottom of page 61, NHDES states "All of the New Hampshire sources listed in Table 2-6 which have maximum estimated visibility extinction above 1 Mm^{-1}…." Did NHDES use the 1 Mm^{-1} threshold for additional analyses?

NHDES Response: The 3 Mm^{-1} threshold was chosen by MANE-VU for its "ASKs" to identify emission sources by modeling that have a large enough anticipated impact to prioritize for further analyses for control. NHDES used a 1 Mm^{-1} threshold to further examine its own emission sources, in addition to any specifically requested by the FLM.

EPA Comment 18: On page 64, NHDES indicates that it closely reviewed the documentation submitted by GSP Merrimack Station and concluded that the existing controls satisfied Ask 2, that is, performing a four-factor analysis for a source that has the potential for 3.0 Mm^{-1} or greater visibility impacts. NHDES then refers to Appendix T, which is a compilation of documents referring to NOx RACT. It is not clear to EPA which part of Appendix T is meant to satisfy the four-factor analysis requirement. NHDES should also include the four-factor analysis for SO_2. We recommend that NHDES clearly identify where the four-factor analysis is located. Additionally, NHDES should summarize all four factors individually in the SIP narrative itself. Further, the analysis within the SIP narrative ends without clearly explaining the results of the four-factor analyses and what is necessary to make reasonable progress.

[5] Memo from EPA to Regional Air Directors, Regions 1-10, (July 2021). *Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period*. Available at: https://www.epa.gov/system/files/documents/2021-07/clarifications-regarding-regional-haze-state-implementation-plans-for-the-second-implementation-period.pdf

NHDES Response: The four-factor analysis for NOx on five combustion turbines is provided as Attachment B to GSP's August 30, 2018, Response to NHDES's Request for Information on MANE-VU "Ask" Associated with the Regional Haze Rule in Appendix T. The analysis covers four facilities with similar technologies and operating profiles. In addition, a four-factor analysis for NOx and SO_2 at Merrimack Station were added to Appendix T. A summary of the results of the four-factor analyses was added to Section 4.2.9.

EPA Comment 19: For Ask-4, New Hampshire indicates that no facilities in the state meet the specification of "*EGUs and other large point emission sources greater than 250 MMBTU per hour heat input that have switched operations to lower emitting fuels – lock-in lower emission rates for SO_2, NOx and PM.*" However, on page 60, New Hampshire indicates that Schiller SR5 is a wood-fire boiler that is permitted to fire coal. New Hampshire states that "SR5 has only fired coal for collecting performance test data in November 2006 during the commissioning of the boiler." New Hampshire should consider locking in a requirement to only burn biomass.

NHDES Response: Schiller SR5 has the operational flexibility to use coal as permitted under the Title V permit, TV-0053. Therefore, the facility has not officially switched operations to a lower emitting fuel as described in "Ask #4". Under "Ask #1", NHDES determined that the existing pollution control equipment (SNCR and DSI) installed on SR5, the federally enforceable NO_X RACT emission limits contained in RO-003 and ARD-06-001, and the NO_X and SO_2 emission limitations required by TV-0053 on a year-round basis ensure the most effective use of the control technologies for PM, SO_2 and NOx emissions.

EPA Comment 20: Page 70 – In Table 5-1, including the data for the current (2015-2019) and baseline (2000-2004) periods satisfies 51.308(g)(3)(i) and (ii), but does not satisfy (iii). Please add data and reference the change in visibility since the period addressed in the most recent progress report (See Section 40 C.F.R. 51.308(f)(5)). That may be the 2011-2015 five-year period or whatever similar period best represents the rule requirement. A similar comment on the Figure 5-3 pie charts on page 72. The main purpose of the progress report under 308(g) is to report progress since the most recent progress report SIP was submitted. Adding a set of pies for the interim period (representing the last years of ambient data period analyzed in the last progress report) would help better represent the recent progress.

NHDES Response: Section 5.3 was revised to include more recent data. Figure 5-3 was expanded to include the interim period.

EPA Comment 21: Page 84 – "For applicable states, some of the SO_2 reductions for AMPD sources is attributed to CSAPR (formerly CAIR)…" CAIR and CSAPR are two different programs, CSAPR was not formerly CAIR.

NHDES Response: This was corrected in the SIP.

EPA Comment 22: Page 93 – "Because New Hampshire finds measures included in this SIP to be reasonable to pursue at this time, they are included in this SIP update along with appropriate technical analysis, rulemaking, and public review."

40 CFR 51.308(f)(2) requires New Hampshire to submit a long-term strategy, which "must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress…." New Hampshire should clearly identify the components of the long-term strategy for the second planning period. Any measure (new or existing) that New Hampshire determines to be necessary for reasonable progress must be incorporated into the SIP.

NHDES Response: The Long-Term Strategy section of the SIP, specifically Section 4.2.10, identifies the federally enforceable measures required for reasonable progress.

EPA Comment 23: Appendix T: Granite Shore Power Regional Haze and NOx RACT Letters, July 25, 1994, May 25, 2018, August 30, 2018, and January 17, 2020. The Four-Factor Analyses are different than Reasonably Available Control Technology (RACT) analyses. Under 40 C.F.R. 308(f)(2)(i), the state must clearly consider emission reduction measures necessary to make reasonable progress based on the four statutory factors (the costs of compliance, the time necessary for compliance, and the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any existing source). The outcome of the consideration is a determination of appropriate measures, including upgrades and operational changes, for inclusion in the long-term strategy.

Additionally, when calculating cost of control, EPA's Cost Control Manual recommends the use of the prime interest rate, or a firm specific rate if available. The 7% rate is not recommended as a default.

> **NHDES Response**: The four-factor analysis for NOx on five combustion turbines is provided as Attachment B to GSP's August 30, 2018, Response to NHDES's Request for Information on MANE-VU "Ask" Associated with the Regional Haze Rule in Appendix T. The analysis covers four facilities with similar technologies and operating profiles. In addition, a four-factor analysis for NOx and SO_2 at Merrimack Station were added to Appendix T. A summary of the results of the four-factor analyses was added to Section 4.2.9.
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> The 7% interest rate applied in the cost analysis of the four-factor analysis for the combustion turbines was revised to 5%, the prime interest rate in 2018, resulting in a 9% reduction in the calculated cost effectiveness in dollars per ton of NOx removed. The revised analysis was added to Appendix T.

EPA Comments on New Hampshire's December 5, 2021 draft New Hampshire Regional Haze Plan Periodic Comprehensive Revision Received February 25, 2022.

EPA Comment 24: In the "New Hampshire Regional Haze Plan Periodic Comprehensive Revision" document, on page 38, NH DES should consider revising the last row in "Table 4-1: Baseline Visibility…" to change the last row entry which currently reads "5-yr Average" to read "4-yr Average" to be consistent with the narrative on page 36 that explains how a 4-yr average is used for New Hampshire. Also on page 38, there is a typo in the citation to the regulatory requirements for calculating current visibility conditions – the citation should read "40 CFR § 51.308(f)(1)(iii)."

> **NHDES Response:** Label in Table 4-1 revised and regulatory citation corrected.

EPA Comment 25: In Appendix T, the Attachment titled "Granite Shore Power LLC. Reasonable Progress Report" on page 3, in section 3.3, there is a typographical error whereby the NOx emission rate limit for Merrimack Station MKCT1 and MKCT2 is stated as "0.09 pounds per million British Thermal unit (lb/MMBtu)," however the Title V permitted limit is actually "0.90" lb/MMBtu. Similarly, on the same page in section 3.4, a Schiller Station NOx emission rate limit is stated as "0.09 lb/MMBtu," however the Title V permitted limit is "0.90" lb/MMBtu.

> **NHDES Response:** NHDES appreciates identification of this discrepancy. The referenced documents in Appendix T were not created by NHDES, therefore we are not able to correct this error. NHDES agrees that the permit limit should read 0.90 lb/MMBtu. GSP verified that the incorrect value was not used in the analysis for the Reasonable Progress Report.

EPA Comment 26: In "Appendix W: Compilation of Public Comments and New Hampshire's Responses Thereto (2021)", starting on page 8, NHDES responds to EPA's comment about Ask-4, "EGUs and other large point emission sources greater than 250 MMBTU per hour heat input that have switched operations to lower emitting fuels – lock-in lower emission rates for SO_2, NOx and PM," specifically a requirement for Schiller SR5 to be limited to wood-fired fuel and remove the provision to allow coal fuel. NH DES could expand upon its response in its statement that NH is "able to maintain reasonable progress with this provision in place." For example, NH DES might reference the other limits recently imposed on the existing coal-fired boilers in NH that do support Ask-4.

NHDES Response: Response to EPA Comment 19 above has been revised to include discussion of measures applicable to Schiller SR5 that ensure reasonable progress.

FLM Comments

After completion of the FLM consultation the National Park Service stated, "...we are satisfied with the four-factor analyses completed by New Hampshire." In addition, the Forest Service was satisfied with the draft provided and had no further comments or questions.

State Comments

Contribution to Visibility Impairment

NCDAQ Comment Letter Section II: Thus, consistent with the draft results provided in my previous comments, these contributions illustrate that it is highly unlikely that North Carolina contributes ≥ 2% of the visibility impairment at the GGPRDR Wilderness Areas which MANE-VU used as the only criterion for including North Carolina in the Inter-RPO Ask.

VADEQ Comment Letter page 4: Virginia emissions do not impact New Hampshire Class I areas to any appreciable extent, and thus Virginia emissions cannot reasonably be screened into any type of reasonable progress analysis for New Hampshire Class I areas.

NHDES Response: NHDES thanks NCDAQ and VADEQ for these comments and for participating in the consultation process. We appreciate your assistance in creating a federally approval SIP and ask that NC and VA carefully review the elements of the MANE-VU Ask, address them in their SIPs, and adopt the emission control measures that they find reasonable to improve visibility.

Use of 2028 Emissions Projections

NCDAQ Comment Letter Section II.A/VADEQ Comment Letter page 3: The DAQ/DEQ disagrees with New Hampshire's assessment that much of the emission reductions between 2011 and 2028 are due to "economic factors that are not locked in for 2028" and may "distort results if the economics change prior to 2028."…These control programs are not economic factors but rather federal mandates.

NHDES Response: NHDES respectfully asks North Carolina and Virginia to document into their respective SIPs any federally enforceable measures that may not be reflected in the MANE-VU analyses that would reduce SO_2, NOx and VOC emissions. This would include closure or replacement of coal units and/or control programs for non-road and on-road engines. If the changes are not the result of market factors, it is important to document how visibility reducing emissions will be limited moving forward.

Response to MANE-VU Ask

NCDAQ Comment Letter Section I: "…the DAQ concludes that adopting an ultra-low sulfur fuel (ULSF) standard would yield very little reduction in sulfur dioxide emissions or any noticeable improvement in visibility in Class I areas in North Carolina and in downwind states. This is not a reasonable measure for North Carolina to adopt to improve visibility in Class I areas, and I request that New Hampshire exclude this strategy for North Carolina from its modeling of any reasonable progress goals (RPGs) for the GGPRDR Wilderness Areas.

NHDES Response: NHDES appreciates the fuel consumption analysis that NC performed, as documented in Attachment 1 to its February 23, 2022 comment letter. Nevertheless, NHDES respectfully asks North Carolina to consider pursuing such fuel standards as enforceable SIP measures, or to include in its SIP record a description, such as that in Attachment 1 of its letter, as to why the adoption of such standards is infeasible (Note: per a March 2, 2022 email from NCDAQ to Sharon Davis, NJDEP and David Healy, NHDES, NCDAQ intends to include its March 2, 2022 MANE-VU comment response letter, which contains such a description, in its regional haze SIP submittal to EPA).

CALPUFF analysis

VADEQ Comment Letter page 2: In particular DEQ questioned the use of a three inverse megameter (Mm^{-1}) threshold applied to CALPUF[F] analysis results where the emissions were based on the 95th percentile of daily 2015 emissions at electrical generating units (EGUs). The relationship between the 95th percentile of daily 2015 emissions at any particular stack and the regulatory standard of the 20% most impaired days is unclear and should be thoroughly explained within the New Hampshire SIP.

> **NHDES Response:** The visibility threshold of 3 Mm^{-1} was developed as a screening threshold to identify the sources that are reasonably anticipated to contribute to visibility impairment at one or more MANE-VU Class I areas and that may, therefore, require further analysis. The screening threshold, and the 2015 95th percentile daily emissions used to screen sources against that threshold, do not have any regulatory relationship with the 20% most impaired days. However, the threshold and the CALPUFF analysis were designed to evaluate and address those sources that would potentially have the most significant impacts on the 20% most impaired days.
>
> As discussed in the consultation process, if VA's current and projected future emissions are lower than what MANE-VU assumed for the CALPUFF screening analysis, they are encouraged to document such reductions in their SIP, including any enforceable shutdowns that have occurred in the time since the CALPUFF screening analysis emissions year of 2015. Note that the MANE-VU CALPUFF screening analysis, which was performed in the very early stages of MANE-VU's regional haze SIP development process for the second implementation period, should not be confused with the photochemical modeling that was performed by MANE-VU to establish its 2028 reasonable progress goals. We further note that the MANE-VU CALPUFF screening cannot be directly compared to photochemical modeling that averages impacts over the 20% most impairs days. MANE-VU concluded that while this 20% metric is critical to visibility requirements, it excludes too many high-emitting emissions sources that potentially could improve reasonable progress.

Public Comments

New Hampshire Cannot Rely on Prior Emission Limit Determinations at Merrimack Station to Meet Its Reasonable Further Progress Obligations

SC/AMC/NPCA/CLF Comment 1: Here, the proposed 0.22 lbs/MMbtu NOx limits for the two Merrimack units are inconsistent with both RACT and Regional Haze requirements. First, such limits appear to be little more than improper rubberstamping of existing behavior at Merrimack….Nor is it necessary that DES allow Merrimack to emit greater quantities of NOx at higher emission rates on the days in which a unit undergoes startup or shutdown. Notwithstanding the theory that lowered control inlet temperatures during startup and shutdown necessitate bypassing the SCR, recent information shows that SCR controls can in fact be operated at low-temperature levels with no detriment to control efficacy or longevity.

> **NHDES Response**: NHDES recognizes that NOx emission rates for various coal facilities across the country are on average lower than the rates for the units at Merrimack Station, however NHDES has met the requirements outlined for setting RACT standards as well as the regional haze rule. The commenter notes that RACT is defined as "the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonable available considering technological and economic feasibility." Also, "RACT for a particular source is determined on a case-by-case basis, considering the technological and economic circumstances of the individual source."[6] Given this criteria, NHDES selected RACT for Merrimack's MK1 and MK2 units station based on comparison to similar cyclone boiler units that operate SCR controls on a year-round basis. The Merrimack units have unique characteristics including higher NOx levels generated by high operating temperatures and the challenge of balancing efficient

[6] 44 FR 53762

operations of multiple controls devices to optimize emissions for multiple pollutants. NOx is controlled with SCRs, the best available technology for cyclone-fired boilers.

The average NOx emission rates for MK1 and MK2 from 2015 -2017, prior to implementation of the RACT standard were 0.27 lb/MMBtu and 0.24 lb/MMBtu, respectively. The average rate for all cyclone boilers across the country was 0.22 lb/MMBtu in 2018. Therefore, the current NOx limit improves emission rates from previous levels and matches rates for similar technology. In addition, the regional haze rule requires an additional four-factor analysis to review and consider any new or supplemental technologies that could further reduce NOx emission levels. The four-factor analysis confirms that new technologies or changes to existing controls are not technically feasible at this time.

Separate Limits for Startup/Shutdown

Regarding separate limits for startup and shutdown, NHDES, GSP and EPA agreed that separate limits were necessary to cover the operating periods where the SCRs cannot be operated. GSP identified 17-27% of their operating hours in 2017[7] as hours where conditions did not meet the SCR requirements. The steady state limits would have to be even higher to include startup shutdown scenarios, therefore a separate limit on steady state operations ensures lower emissions for the majority of operating hours. An independent limit for startup and shutdown ensures those scenarios are also controlled and as consistent as possible to minimize emissions.

Similar Technology

Principles of RACT not only include comparison of achievable emission rates, but also consideration of other factors such as boiler design, operating profile, age of equipment, capacity, fuel types, and control technologies. The boiler technology at Merrimack is not equivalent to the examples provided by the commenter. The cited limit of 0.125 lb/MMBtu in Delaware applies to one dry bottom turbo unit. Maryland's limit of 0.1 lb/MMBtu applies to one fluidized bed boiler with SNCR controls. All other coal-fired EGUs in Maryland have different boiler designs from the Merrimack units.[8] The commenter also compared emission rates from the Schiller plant to the Merrimack units. Schiller has two, dry bottom wall-fired boilers and one fluidized bed boiler all using SNCR for NOx controls. Emission rates from different technologies are not achievable or reasonable given the site-specific conditions at the Merrimack facility.

The commenter also cites EPA's analysis of SCR-equipped coal units in support of the Cross State Air Pollution Rule. In EPA's response to comments on the CSAPR rule, EPA notes that the 0.08 lb/MMBtu NOx rate is proposed as a fleet-wide average. EPA states, "Some of these units may achieve rates that are lower than 0.08 lb/mmBtu, and some units may operate above that rate based on unit-specific configuration and dispatch patterns."[9] As evaluated in the site-specific analysis for both RACT and regional haze, the units at Merrimack station are not capable of meeting 0.08 lb/MMBtu with currently available technology. The design of the cyclone boilers at Merrimack Station produces a higher level of NOx than most of the technologies considered in the CSAPR analysis. Another key difference is the capacity factor at Merrimack which is significantly lower than the 47.6% capacity factor assumed in the analysis. In order to mitigate NOx emissions at Merrimack, the SCR efficiencies are 83% for MK1 and 91% for MK2 which are higher than the efficiencies for most cyclone boilers as well as the units evaluated for CSAPR. Finally, to maximize the benefit of the SCRs, they are operated year-round at Merrimack rather than just seasonally.

7 Appendix T GSP Letter May 25, 2022
8 86 FR 4049 Table III-4
9 https://www.federalregister.gov/d/2021-05705/p-506

Operating Profile

NHDES appreciates the effort of the commenter to review historic emissions from the Merrimack facility, however the emission rates shown in Table 2 represent a time period when the facility primarily ran at baseload with newer SCR and catalyst components. Baseload conditions are ideal to maintain emission rates and optimize emission controls for steady state conditions. The current operating profile includes many more startups and shutdowns per year resulting in more operating hours when the SCR cannot run. The upward trend in annual average NOx emission rate is the result of changes in unit dispatch, and not less rigorous application of emission controls.

SCR Enhancement

The commenter refers to a sorbent injection technology that can reduce the operating temperature of the SCR and potentially reduce NOx emissions at low loads. NHDES reviewed the references provided and understands that this technology allowed the Duke Gibson units to operate not only the SCRs at a lower temperature, but also the coal boilers could run at a lower load while minimizing emissions. Due to differences in the boiler technology at Merrimack, MK1 and MK2 are not designed to operate at lower temperatures, nor intended to hold at lower loads, even if the SCR can come online earlier. A small change in temperature might allow the SCRs to operate slightly earlier during startup, but this would not justify the significant capital costs. Using 2021 as an example, MK1 and MK2 operated for approximately 2,155 hours and were started up approximately 26 times. Assuming that the lower temperature permissive allowed the SCRs to operate 1 additional hour during startup, this would result in a total of 26 additional hours of SCR operating time out of 2,155 boiler hours.

New Hampshire Must Incorporate Recent Low Capacity Factors at Merrimack and Schiller into Its Haze SIP

SC/AMC/NPCA/CLF Comment 2:

While DES properly does not rely on unenforceable reductions in pollution from Granite Shore Power's two coal-fired power plants—Merrimack and Schiller—to achieve its Reasonable Further Progress obligations, the Haze SIP must incorporate recent decreased capacity factors at these two facilities to bar against future operations increases jeopardizing Further Progress.

NHDES Response:

The commenter correctly notes that capacity at both Merrimack and Schiller have decreased since 2015. This is a function of increased natural gas supply and reduced need for power generated by these facilities. However, to maintain operational flexibility for these facilities should market forces change, NHDES does not intend to make the current market-driven capacity factors enforceable.

The 2028 reasonable progress goals (RPGs) that NHDES has adopted into its regional haze SIP were established using the enforceable limits shown in Tables 4-14 and 4-15 (for Merrimack) and Table 4-16 (for Schiller) of NHDES' regional haze SIP. 2028 modeled capacity utilization for Merrimack and Schiller, and indeed all applicable electric generating units (EGUs) in the MANE-VU photochemical modeling domain, were projected using the Eastern Regional Technical Advisory Committee's (ERTAC) ERTAC-EGU projection model. It should be noted that ERTAC-EGU is more conservative, and more accurate, than EPA's Integrated Planning Model (IPM) for Merrimack and Schiller in that IPM predicts that these facilities will shut down in future years.

As described in Section 5.3 and shown in Table 5-1 of NHDES' regional haze SIP, measured haze indices at New Hampshire's Class I areas have made significant progress towards the goal of natural conditions by 2064. With the current limits for Merrimack and Schiller, and all of the other enforceable measures adopted into NHDES' SIP, current (2015-2019) haze indices are already 0.37 deciview (dv) below the 2028 RPG for the clearest days and only 0.2 dv above the 2028 RPG for the most impaired days. Further,

current most impaired haze indices are almost 5 dv below the 2028 level of Uniform Rate of Progress (URP). It should be noted that being below the level of URP is not considered a "safe harbor" from adopting measures necessary for reasonable progress, as NHDES has properly done in its SIP. Nevertheless, being below the URP is still a good indicator of progress towards the ultimate goal of natural visibility conditions by 2064.

DES Must Consider Climate Change and Environmental Justice In Order to Comply with Executive Orders

SC/AMC/NPCA/CLF Comment 3:

New Hampshire can and should facilitate EPA's compliance with these Executive Orders by considering climate change impacts and environmental justice in its SIP submission….

NHDES Response:

New Hampshire's SIP revision does not specifically add new climate change or environmental justice initiatives. The regional haze long-term strategy includes measures that will ultimately reduce greenhouse gas emissions and improve air quality in environmental justice regions.

These issues are better addressed by higher level programs or policies such as New Hampshire's participation in a cap and trade program for greenhouse gas emissions as discussed in Section 4.2.9 of the SIP and creation of a NHDES environmental justice team. In 2021, the Title VI Nondiscrimination/ Environmental Justice Team was formed to ensure compliance with Title VI nondiscrimination legal requirements and in incorporating the non-regulatory environmental justice principles of fair and equitable treatment that encourages meaningful involvement of impacted communities into agency programs, practices, and policies. Through its efforts, the team seeks to reduce disparities that result in vulnerable populations in NH bearing a disproportionate impact relative to the implementation of programs, policies and practices related to the environment.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

August 3, 2021

Cathy Beahm, SIP Planning Administrator
Air Resources Division
New Hampshire Department of Environmental Services
P. O. Box 95
Concord, NH 03302-0095

Dear Ms. Beahm

On April 19, 2021, New Hampshire Department of Environmental Services (NH DES) provided the draft New Hampshire Regional Haze Plan Periodic Comprehensive Revision for EPA comment. We have reviewed the draft and enclosed our comments. If you have any questions, please call Anne McWilliams of my staff at 617-918-1697.

Sincerely,

John Rogan, Manager
Air Quality Branch

Enclosure

Enclosure

Comments on New Hampshire's April 19, 2021 draft New Hampshire Regional Haze Plan Periodic Comprehensive Revision

General Comment: While MANE-VU provided the technical analyses for the development of the Regional Haze Plans, New Hampshire's narrative should reflect how its decision making during the development of the plan culminated in a SIP submission that meets the requirements of the regional haze program, 40 C.F.R. Section 308(f) and (g), to improve visibility at the New Hampshire Class I areas. Our comments below provide detailed feedback on the SIP, and we emphasize several central points in this first General Comment.

New Hampshire relies heavily on MANE-VU's Asks to satisfy its regional haze requirements. EPA greatly appreciates New Hampshire's collaboration with its nearby states through MANE-VU. However, New Hampshire has an independent obligation to satisfy the regulatory requirements relating to (among other things) source selection, four-factor analyses, and development of a long-term strategy that makes reasonable progress. New Hampshire's draft SIP provides little explanation as to how satisfying MANE-VU's Asks is consistent with these legal requirements. Similarly, the State provides almost no explanation of whether its choices are consistent with EPA's August 2019 Policy Guidance, and if not, why the State has chosen a different approach. We encourage the State to justify its approach, including its decision to address MANE-VU's Asks, based on the statutory and regulatory requirements, as well as with EPA's guidance.

Specifically, we encourage the State to clearly explain and justify its criteria for source selection for four-factor analysis. As an initial matter, it is unclear whether the State's criteria is 3 inverse megameters, 1 inverse megameter, or something else. Moreover, regardless of which criteria the State is adopting, the State offers very little justification as to why that criteria is appropriate. We encourage New Hampshire to carefully review the source selection portions of the 2019 Guidance and the recently issued 2021 Clarifications Memorandum, and set forth explanations for source selection that are consistent with that guidance and the underlying statutory and regulatory requirements.

Notwithstanding this lack of explanation, EPA appreciates and commends New Hampshire's evaluation of numerous in-state sources. Robust evaluation of a reasonable set of in-state sources is central to an approvable regional haze SIP. Even if New Hampshire determines that no new measures are necessary at selected sources, the State must nonetheless still assess whether existing measures are necessary for reasonable progress. If they are necessary to make reasonable progress, those measures must be incorporated into the regulatory portion of the SIP, unless they are already incorporated therein. As EPA explained in the 2021 Clarifications Memorandum, existing measures are generally necessary for reasonable progress, but a state may make a weight-of-evidence demonstration that such measures are not necessary. We recommend that New Hampshire follow the approach outlined in the Clarifications Memorandum in determining whether existing measures are necessary to make reasonable progress.

Finally, we commend the work New Hampshire has already done, including its notable progress toward preventing and remedying regional haze over the past two decades, and its collaboration with MANE-VU, nearby States, and in-state sources. However, we emphasize an approvable regional haze SIP is one that adequately addresses the statutory and regulatory requirements. We recommend that New Hampshire thoroughly justify its choices based on those legal requirements as well as EPA's guidance, especially with regard to the points noted above and throughout this comment letter.

Specific Comments

Page 23- NH considered a contribution threshold of 2% of sulfate plus nitrate contribution to determine that emissions from NH contribute to Acadia, Moosehorn, and Great Gulf. There are additional Class I areas with contributions from NH emissions of >1% that should also be considered (Brigantine and Lye Brook). The statutory language "may reasonably be anticipated to cause or contribute" (169A(b)(2)) and the regional haze rule language "may be affected by emissions from the State" (51.308(f)(2)) are very low bars, i.e., it is very difficult to demonstrate that emissions from a state do not cause or contribute to visibility impairment in a nearby Class I area. We note, moreover, that it appears that NH has already consulted with Vermont and New Jersey (where Lye Brook and Brigantine are located, respectively) through the MANE-VU consultation process and has considered the impacts of its sources on those Class I areas, see, e.g., Table 2-6. Thus, it is unclear why the State has nonetheless chosen a relatively high 2% threshold. We recommend that the chosen threshold of 2% should be further justified.

Page 30 – "In the resolution, the Class I states agreed to set reasonable progress goals for 2018…" should be revised to 2028.

Page 31 – "Further, New Hampshire depends on EPA and the FLMs to fulfill the Ask requested of them and to ensure the MANE-VU Asks are adequately addressed in the SIPs of all contributing states." It is unclear what New Hampshire means by "adequately addressed."

Page 33 – The last paragraph should be revised to read: "Natural visibility conditions refer to the visibility conditions that existed before human activities affected air qualtiy in the region. Consistent with the stated visibility goals of the Clean Air Act, natural visibility conditions is identified as the visibility target to be reached in each Federal Class I area."

Page 37 – "Class I states must have information that will be considered by contributing states so that during the interstate consultation process, they can make reasonable asks for controls to be implemented. To achieve these two ends, the MANE-VU Four-Factor/Contribution Assessment Workgroup, a subset of the Technical Support Committee, collected the information and summarized it in a memo." New Hampshire should include in its implementation plan a discussion of how the four statutory factors were considered in developing the "Asks," as required by 40 CFR 51.308(f)(2)(i).

Page 40 – The text indicates that New Hampshire ICI boilers contributing to 50% of the impairment at a MANE-VU Class I area include: Dartmouth College and Gorham Paper & Tissue LLC. New Hampshire's contribution assessment was based on 2011 emissions. If a state uses a value for emissions in an earlier year such as 2011, we recommend the state consider whether emissions have appreciably changed (or will change) between the earlier year, a more recent time period, and the projected future year (2028). In addition, the regional haze rule specifically requires evaluation of emissions information from 2017 or a more recent year (51.308(f)(2)(iii)).[1] It is especially important to consider whether source emissions have increased or are likely to increase between 2011, a recent time period (i.e., 2017 or a later year), and in 2028. 2019 Guidance at 17.

Also on page 40, the SIP states, without further elaboration, that the number of sources was limited to those that cumulatively contributed to 50% of the impairment. Please explain why this threshold was chosen and why it is reasonable.

Page 43 – The MANE-VU "Ask" - As a MANE-VU State with a Class I area, New Hampshire should provide the four-factor analyses that New Hampshire considered to develop the "Asks," both individually and collectively. New Hampshire should also explain what it means to "meet" a MANE-VU Ask and how "meeting" the Asks relates to making reasonable progress. Are "meeting" an Ask and "addressing" an Ask mean the same thing? Further, if New Hampshire completes (or adopts) a four-factor analysis to "meet" an Ask and concludes that no additional controls are necessary, New Hampshire should clarify how such a conclusion relates to reasonable progress.

Page 48 – Typo in "4.2.6 Technical Basis for MANE-VU "Ask""

Page 51 – "MANE-VU predicts 2028 RPGs of 12.00 dv with the MANE-VU "Ask" and 12.13 dv without." There is some uncertainty in the number, but NH should pick one. It is probably better to not assume that the upwind states will do all of the MANE-VU Asks and therefore use the 12.13 dv number.

Page 52 – Section 4.5 Meeting the "Ask" – New Hampshire, this section should be moved up to be with the LTS section or right after. It is confusing to put this *after* the RPG section.

Page 54 & throughout – in various instances in the draft SIP, NHDES made the determination that "no further limitations as a result of MANE-VU "Ask [#1]" are required of this source. NH DES should provide the enforceable mechanism in the Appendix for easy reference.

[1] "The emissions information must include, but need not be limited to, information on emissions in a year at least as recent as the most recent year for which the State has submitted emission inventory information to the Administrator in compliance with the triennial reporting requirements of subpart A of this part."

More generally, all of the measures (whether new or existing) necessary for reasonable progress must be clearly identified as part of New Hampshire's long-term strategy and incorporated into the regulatory portion of the SIP. We note that the current long-term strategy section contains a lengthy discussion of various state and federal requirements, and it is not clear to EPA which of those is actually part of the long-term strategy and which of those are simply other requirements related to NOx and SO2. The State should more clearly identify what is actually part of its long-term strategy.

For Ask-2, New Hampshire should provide the rationale for selecting the 3.0 Mm^{-1} screening threshold. New Hampshire should also explain how the MANE-VU threshold is consistent with making reasonable progress. It is not enough to merely reference the MANE-VU 3.0 Mm^{-1} threshold without explaining why a four-factor analysis was not conducted for additional large sources within the state.

As noted in the Clarifications Memo at Page 3, "In applying a source selection methodology, states should focus on the in-state contribution to visibility impairment and not decline to select sources based on the fact that there are larger out-of-state contributors. What is reasonable will depend on the specific circumstances. We generally think that a threshold that captures only a small portion of a state's contribution to visibility impairment in Class I areas is more likely to be unreasonable. Similarly, a threshold that excludes a state's largest visibility impairing sources from selection is more likely to be unreasonable."

On the bottom of page 61, NHDES states "All of the New Hampshire sources listed in Table 2-6 which have maximum estimated visibility extinction above 1 Mm-1…." Did NHDES use the 1 Mm^{-1} threshold for additional analyses?

On page 64, NHDES indicates that it closely reviewed the documentation submitted by GSP Merrimack Station and concluded that the existing controls satisfied Ask 2, that is, performing a four factor analysis for a source that has the potential for 3.0 Mm^{-1} or greater visibility impacts. NHDES then refers to Appendix T, which is a compilation of documents referring to NOx RACT. It is not clear to EPA which part of Appendix T is meant to satisfy the four-factor analysis requirement. NHDES should also include the four-factor analysis for SO_2. We recommend that NHDES clearly identify where the four-factor analysis is located. Additionally, NHDES should summarize all four factors individually in the SIP narrative itself. Further, the analysis within the SIP narrative ends without clearly explaining the results of the four factor analyses and what is necessary to make reasonable progress.

For Ask-4, New Hampshire indicates that no facilities in the state meet the specification of "*EGUs and other large point emission sources greater than 250 MMBTU per hour heat input that have switched operations to lower emitting fuels – lock-in lower emission rates for SO_2, NOx and PM.*" However, on page 60, New Hampshire indicates that Schiller SR5 is a wood-fire boiler that is permitted to fire coal. New Hampshire states that "SR5 has only fired coal for

collecting performance test data in November 2006 during the commissioning of the boiler." New Hampshire should consider locking in a requirement to only burn biomass.

Page 70- In Table 5-1, including the data for the current (2015-2019) and baseline (2000-2004) periods satisfies 51.308(g)(3)(i) and (ii), but does not satisfy (iii). Please add data and reference the change in visibility since the period addressed in the most recent progress report (See Section 40 C.F.R. 51.308(f)(5)). That may be the 2011-2015 five-year period or whatever similar period best represents the rule requirement. A similar comment on the Figure 5-3 pie charts on page 72. The main purpose of the progress report under 308(g) is to report progress since the most recent progress report SIP was submitted. Adding a set of pies for the interim period (representing the last years of ambient data period analyzed in the last progress report) would help better represent the recent progress.

Page 84 – "For applicable states, some of the SO_2 reductions for AMPD sources is attributed to CSAPR (formerly CAIR)…" CAIR and CSAPR are two different programs, CSAPR was not formerly CAIR.

Page 93 - "Because New Hampshire finds measures included in this SIP to be reasonable to pursue at this time, they are included in this SIP update along with appropriate technical analysis, rulemaking, and public review."

40 CFR 51.308(f)(2) requires New Hampshire to submit a long-term strategy, which "must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress…." New Hampshire should clearly identify the components of the long-term strategy for the second planning period. Any measure (new or existing) that New Hampshire determines to be necessary for reasonable progress must be incorporated into the SIP.

Appendix T: Granite Shore Power Regional Haze and NOx RACT Letters, July 25, 1994, May 25, 2018, August 30, 2018, and January 17, 2020.

General Comment: The Four-Factor Analyses are different than Reasonably Available Control Technology (RACT) analyses. Under 40 C.F.R. 308(f)(2)(i), the state must clearly consider emission reduction measures necessary to make reasonable progress based on the four statutory factors (the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source). The outcome of the consideration is a determination of appropriate measures, including upgrades and operational changes, for inclusion in the long-term strategy.

Additionally, when calculating cost of control, EPA's Cost Control Manual recommends the use of the prime interest rate, or a firm specific rate if available. The 7% rate is not recommended as a default.[2]

[2] https://www.epa.gov/sites/production/files/2017-12/documents/epaccmcostestimationmethodchapter_7thedition_2017.pdf

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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5 Post Office Square, Suite 100
Boston, MA 02109-3912

February 25, 2022

Lisa Camire
Air Resources Division
NH Department of Environmental Services
P.O. Box 95
Concord, NH 03302-0095

VIA EMAIL Lisa.J.Camire@des.nh.gov

RE: Proposed NH Regional Haze State Implementation Plan Periodic Comprehensive Revision

Dear Ms. Camire:

We are writing to provide comment for the New Hampshire Department of Environmental Services (DES) proposal to revise the New Hampshire State Implementation Plan (SIP) to meet the requirements of the federal Clean Air Act, section 169A, pertaining to visibility protection for Federal Class I Areas. You will find our comments attached.

As you know, New Hampshire will need to submit the revised regulations to EPA as a State Implementation Plan (SIP) revision once they have been adopted by the State.

If you have any further questions, please contact David Mackintosh at 617-918-1584.

Sincerely,

John Rogan, Branch Chief
Air Quality Planning Branch

EPA COMMENTS FOR NEW HAMPSHIRE PROPOSED REGIONAL HAZE STATE IMPLEMENTATION PLAN PERIODIC COMPREHENSIVE REVISION

1. U.S. EPA Region 1 would like to acknowledge NH DES for its efforts to extend the public comment period and hold a public hearing with both in-person attendance and virtual participation to ensure the community has ample access to provide written and oral comments. NH DES should also be commended for its hard work and collaboration with state and federal partners to develop this Regional Haze Plan Periodic Comprehensive SIP Revision.

2. In the "New Hampshire Regional Haze Plan Periodic Comprehensive Revision" document, on page 38, NH DES should consider revising the last row in "Table 4-1: Baseline Visibility…" to change the last row entry which currently reads "5-yr Average" to read "4-yr Average" to be consistent with the narrative on page 36 that explains how a 4-yr average is used for New Hampshire. Also on page 38, there is a typo in the citation to the regulatory requirements for calculating current visibility conditions – the citation should read "40 CFR § 51.308(f)(1)(iii)."

3. In Appendix T, the Attachment titled "Granite Shore Power LLC. Reasonable Progress Report" on page 3, in section 3.3, there is a typographical error whereby the NOx emission rate limit for Merrimack Station MKCT1 and MKCT2 is stated as "0.09 pounds per million British Thermal unit (lb/MMBtu)," however the Title V permitted limit is actually "0.90" lb/MMBtu. Similarly, on the same page in section 3.4, a Schiller Station NOx emission rate limit is stated as "0.09 lb/MMBtu," however the Title V permitted limit is "0.90" lb/MMBtu.

4. In "Appendix W: Compilation of Public Comments and New Hampshire's Responses Thereto (2021)", starting on page 8, NH DES responds to EPA's comment about Ask-4, "EGUs and other large point emission sources greater than 250 MMBTU per hour heat input that have switched operations to lower emitting fuels – lock-in lower emission rates for SO2, NOx and PM," specifically a requirement for Schiller SR5 to be limited to wood-fired fuel and remove the provision to allow coal fuel. NH DES could expand upon its response in its statement that NH is "able to maintain reasonable progress with this provision in place." For example, NH DES might reference the other limits recently imposed on the existing coal fired-boilers in NH that do support Ask-4.

Camire, Lisa

Subject: FW: NPS/NHDES Regional Haze Consultation Notes and Documentation
Attachments: NPS-NH_RH_ConsultationSlides_06-2021.pdf

From: Salazer, Holly <Holly_Salazer@nps.gov>
Sent: Friday, June 11, 2021 2:54 PM
To: Beahm, Catherine <Catherine.A.Beahm@des.nh.gov>
Cc: King, Kirsten L <kirsten_king@nps.gov>; Peters, Melanie <Melanie_Peters@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; Miller, Debra C <Debra_Miller@nps.gov>; Stacy, Andrea <Andrea_Stacy@nps.gov>; Ralph Perron <ralph.perron@usda.gov>; Allen, Tim <tim_allen@fws.gov>; Anne McWilliams <mcwilliams.anne@epamail.epa.gov>; Eric Rackauskas <rackauskas.eric@epa.gov>; Healy, David <DAVID.S.HEALY@des.nh.gov>; Baru, Padmaja <padmaja.baru@des.nh.gov>; Underhill, Jeff <JEFFREY.T.UNDERHILL@des.nh.gov>
Subject: NPS/NHDES Regional Haze Consultation Notes and Documentation

Hello Cathy,

This letter documents our recent regional haze consultation meeting:

On June 9, 2021, National Park Service (NPS) Air Resources Division (ARD) and NPS Interior Region 1 staff hosted a consultation meeting with New Hampshire Department of Environmental Services (NHDES) to discuss the draft New Hampshire Regional Haze Plan Periodic Comprehensive Revision dated 04/19/21 (SIP). Representatives from the U.S. Forest Service, U.S. Fish & Wildlife Service, and U.S. Environmental Protection Agency, Region 1, also attended. An annotated set of slides shared during the meeting are attached.

While New Hampshire does not have any NPS managed Class I areas, emissions from sources in the state affect visibility at Acadia National Park in Maine. We appreciate your continued involvement in the Mid-Atlantic Visibility Union (MANE-VU) and your commitment to reducing pollutants in the region to help improve visibility in all Class I areas.

In general, we commend NHDES for doing a good job outlining and incorporating the technical analyses produced by MANE-VU in the draft SIP. In particular, we reviewed and have no comments on the four four-factor analyses completed by the state.

We understand that NHDES used the MANE-VU recommended threshold of three inverse Mm visibility impact at a Class I area to screen sources for four-factor analysis. As we have commented to MANE-VU and individual states, we believe the three inverse Mm screening is too high. This threshold – equivalent to approximately one deciview change – does not adequately consider cumulative visibility impacts or those impacts that may occur at Class I areas below that threshold.

With that said, we are satisfied with the four-factor analyses completed by New Hampshire. We appreciate NHDES including all four of the facilities identified by us in a 2018 letter, even though two facilities have dropped from our 2021

recommendations. The two facilities remaining on our 2021 priorities, the Wheelabrator and Burgess BioPower facilities, are very well controlled and we commend the state on its level of analysis and commitment to emission reductions.

We appreciate having the opportunity to consult with NHDES staff on this important draft SIP. We look forward to continuing our work together for clean air and clear views in our national parks into the future.

Sincerely,
Holly Salazer

Holly S. Salazer
Regional Air Resources Coordinator
National Park Service
Interior Region 1, North Atlantic - Appalachian
Penn State Univ.
108 Buckhout Lab
University Park, PA 16802
Office: (814) 865-3100
Cell: (814) 321-3309

6/9/2021
NPS Formal Consultation Call with New Hampshire DES for Regional Haze SIP Development

Attendees:

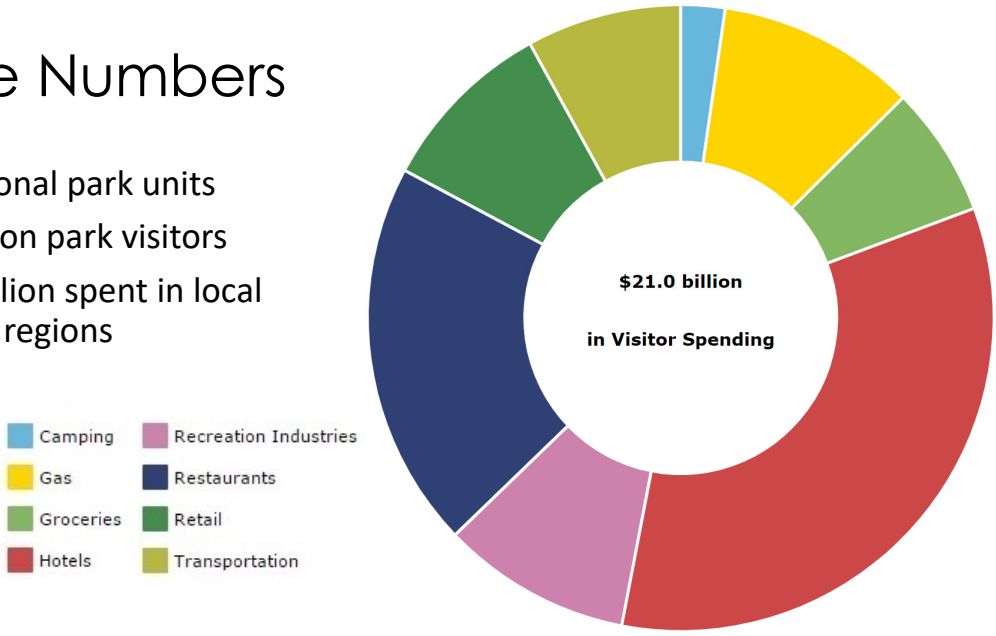
- National Park Service
    - Kirsten King, Air Resources Division (ARD) – Denver, CO
    - Debbie Miller, ARD – Denver, CO
    - Melanie Peters, ARD – Denver, CO
    - **Holly Salazer,** Region 1/Northeast Region – Penn State University **(meeting lead)**
    - Don Shepherd, ARD – Denver, CO
    - Andrea Stacy, ARD – Denver, CO
- New Hampshire DES
    - Catherine Beahm
    - Dan Healy
    - Padmaja Baru
    - Jeff Underhill

- FWS
    - Tim Allen
- USFS
    - Ralph Perron
- EPA
    - Anne McWilliams, Region 1
    - Eric Rackauskas, Region 1

NPS photos from left to right: Acadia NP, Denali NP, Yellowstone NP, Grand Canyon NP

By the Numbers

- 423 national park units
- 328 million park visitors
- $21.0 billion spent in local gateway regions



Nationally in **2019** (a 2020 report was not completed due to the pandemic)

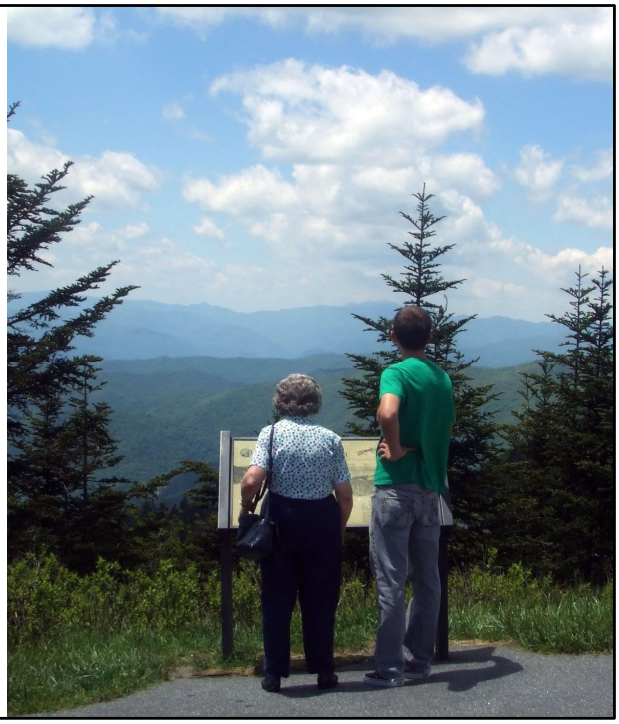
328 million park visitors spent an estimated $21 billion in local gateway regions while visiting National Park Service lands across the country.

These expenditures supported a total of
- 341 thousand jobs,
- $14.1 billion in labor income,
- $24.3 billion in value added, and
- $41.7 billion in economic output in the national economy.

https://www.nps.gov/subjects/socialscience/vse.htm

By the Numbers

- **48** Class I areas
- In **24** states
- **90%** of visitors surveyed say that scenic views are ***extremely*** to ***very*** important
- **100%** of visitors surveyed rate clean air in the **top 5** attributes to protect in national parks



List of Class I areas: https://www.nps.gov/subjects/air/npsclass1.htm

States with at least one Class I area:
AK, AZ, CA, CO, FL, HI, ID, KY, ME, MI, MN, MT, NC, ND, NM, OR, SD, TN, TX, UT, VA, VI, WA, WY

Statistics citation:
Kulesza C and Others. 2013. National Park Service visitor values & perceptions of clean air, scenic views, & dark night skies; 1988–2011. Natural Resource Report. NPS/NRSS/ARD/NRR—2013/622. National Park Service. Fort Collins, Colorado

NPS photo of Great Smoky Mountains NP, NC & TN

The NPS has an affirmative legal responsibility to protect clean air in national parks.

- 1916 NPS Organic Act: created the agency with the mandate to conserve the scenery, natural and cultural resources, and other values of parks in a way that will leave them unimpaired for the enjoyment of future generations. This statutory responsibility to leave National Park Service units "unimpaired," requires us to protect all National Park Service units from the harmful effects of air pollution.
- In the 1970 Clean Air Act: authorized the development of comprehensive federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources. The Act also requires the Environmental Protection Agency to set air quality standards.
- 1977 Clean Air Act Amendments: these amendments to the Clean Air Act provide a framework for federal land managers such as the National Park Service to have a special role in decisions related to new sources of air pollution, and other pollution control programs to protect visibility, or how well you can see distant views. The Act established a national goal to prevent future and remedy existing visibility impairment in national parks larger than 6,000 acres and national wilderness areas larger than 5,000 acres that were in existence when the amendments were enacted. (Class I areas)
- 1990 Clean Air Act Amendments: created regulatory programs to address acid rain and expanded the visibility protection and toxic air pollution programs. The acid rain regulations began a series of regional emissions reductions from electric generating facilities and industrial sources that have substantially reduced air pollutant emissions.

NPS photo of Washington DC: https://npgallery.nps.gov/AirWebCams/wash

Visibility goal:

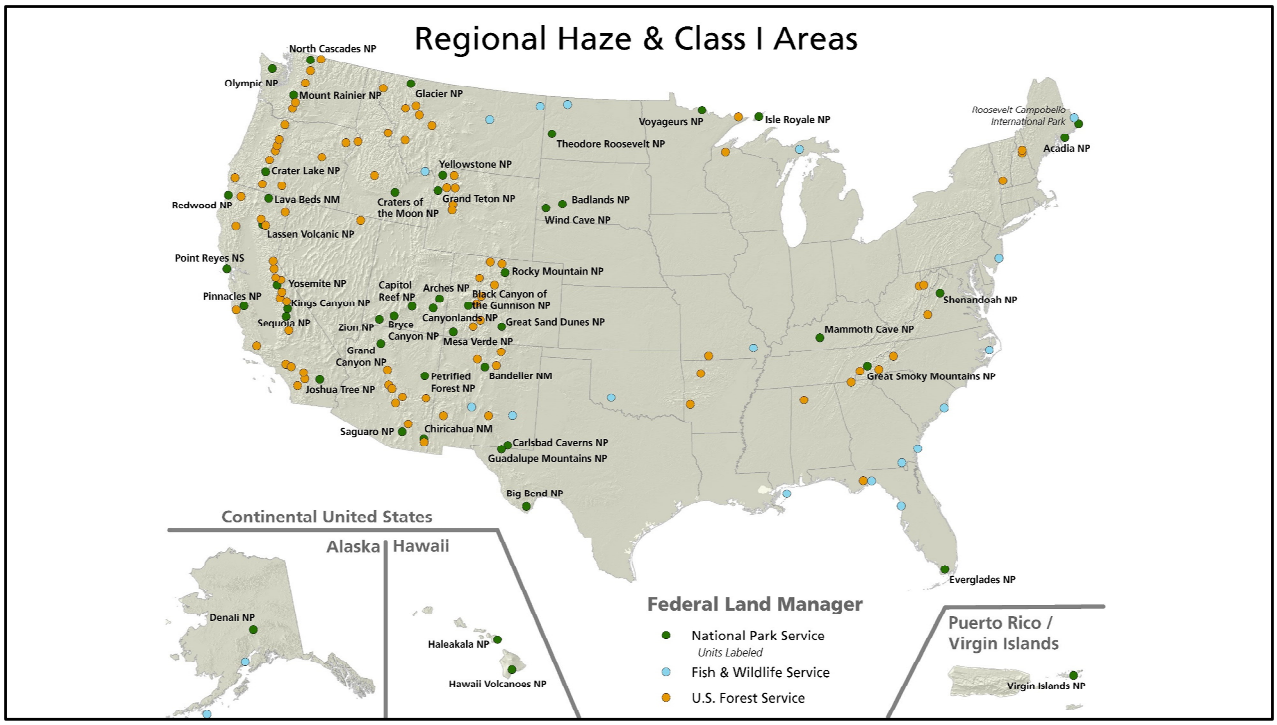
Restore natural conditions by 2064

Yosemite NP, California

Left to right images illustrate hazy to clear conditions.

Haze obscures the color and detail in distant features.

NPS photos of Half Dome in Yosemite NP, CA



As you know, the NPS is one of three Federal Land Managers (FLMs) with responsibility for the 156 Class I areas nationwide. The NPS manages 48 Class I areas.

The closest NPS Class I area to New Hampshire is Acadia National Park in Maine. Nearby, Roosevelt Campobello International Park is administered by the Roosevelt Campobello International Park Commission and considered an affiliated area of the NPS. [About the Park — Roosevelt Campobello International Park]

NPS map of Class I areas, 2020

New Hampshire by the numbers

2 National Parks

31,759 Visitors to National Parks

$2,400,000 Economic Benefit from NP Tourism

1 National Heritage Area

2 Wild & Scenic Rivers Managed by NPS

2 National Trails Administered by NPS

797 National Register of Historic Places Listings

23 National Historic Landmarks

11 National Natural Landmarks

56,906 Objects in National Park Museum Collections

19 Archeological Sites in National Parks

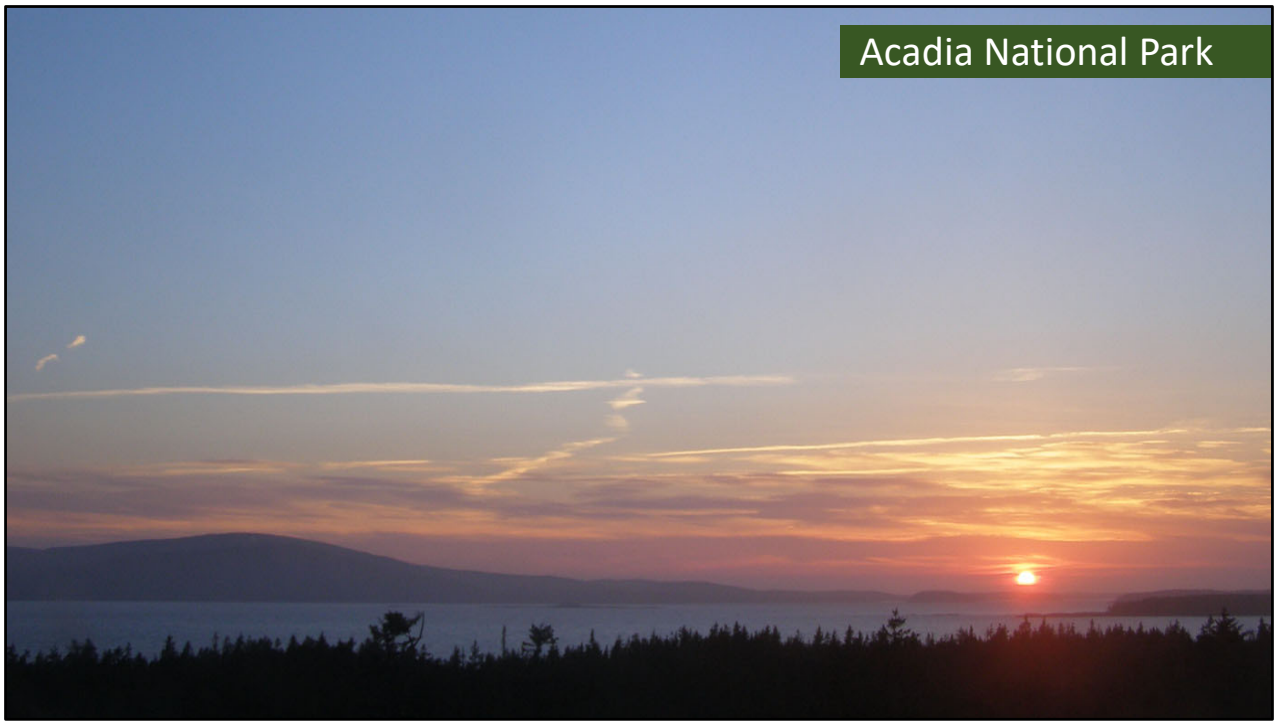
- nps.gov/state/nh

Units managed by the National Park Service in New Hampshire

1. Appalachian National Scenic Trail (U.S. National Park Service) (nps.gov)
2. Saint-Gaudens National Historical Park (U.S. National Park Service) (nps.gov)

2019 Visitor Spending Effects - Economic Contributions of National Park Visitor Spending - Social Science (U.S. National Park Service) (nps.gov)

NPS photo: Saint-Gaudens Main House and Garden



Acadia National Park (U.S. National Park Service) (nps.gov)

Crown Jewel of the North Atlantic Coast - Acadia National Park protects the natural beauty of the highest rocky headlands along the Atlantic coastline of the United States, an abundance of habitats, and a rich cultural heritage. At 3.5 million visits a year, it's one of the top 10 most-visited national parks in the United States. Visitors enjoy 27 miles of historic motor roads, 158 miles of hiking trails, and 45 miles of carriage roads.

From the Acadia National Park Foundation Document –

The importance of scenic views at the park

> Scenic Resources and Values. The scenic views of Acadia and the surrounding landscape are unparalleled along the east coast of the United States. From this landscape, the park offers views of surrounding mountains, stunning sunrises and sunsets, fog-blanketed islands, stormy seas, and inspiring night skies. As the seasons change, visitors enjoy the changing colors and textures of a remarkable landscape.

During April 2021 NPS consultation call with Maine DEP, park superintendent Kevin Schneider emphasized the importance of clean air and good views for visitors of the park during an earlier regional haze consultation call with another northeastern state. The park receives over three million visitors per year and without a doubt they come to enjoy the beautiful views provided by Cadillac Mountain and the many other scenic vistas throughout the park.

NPS photo of Acadia NP, Maine

Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring at Acadia NP- showing filters, nephelometer, and web camera.

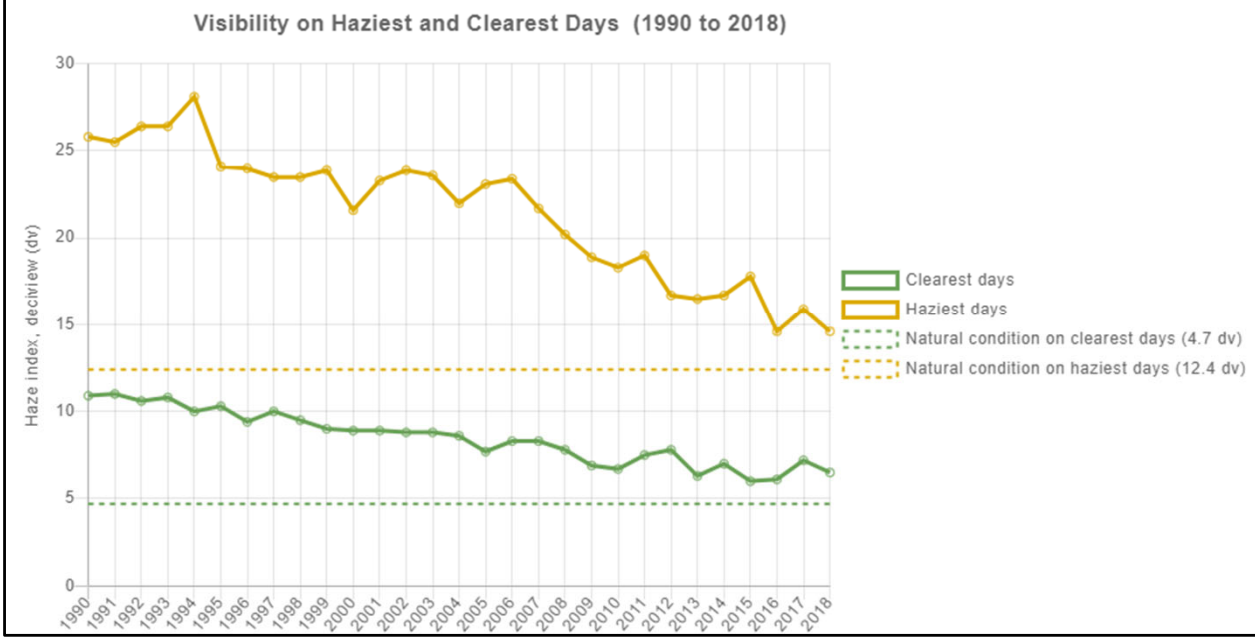
Acadia NP has a long history of air quality monitoring. Historic and current visibility monitoring allow us to determine haze contributors (from the filters), quantify particulate effects (from the nephelometer), and document actual conditions (with scene monitoring from the camera). As a system, this helps demonstrate that NPS perspectives on air quality, in parks across the country, are based on decades of data and analysis.

NPS photos of air quality monitoring equipment at Acadia NP, ME provided by Bill Gawley, park air/water program manager

This spring, Acadia NP air quality specialist Bill Gawley hosted homeschoolers during his Tuesday air monitoring data collection and maintenance duties. Air quality monitoring sites and data are great teaching, public outreach, and interpretation tools! It is always exciting to see young people connect science with resource management.

NPS photos provided by Bill Gawley, park air/water program manager

Acadia National Park



There is a long history of visibility monitoring at Acadia National Park (30+ years!)

Monitoring data show steady improvement on both haziest and clearest days.

Progress has been made since first Regional Haze planning phase, and we want to continue to make progress over this second planning phase as well.

Long term visibility trend graph from:
https://www.nps.gov/subjects/air/park-conditions-trends.htm?tabName=trends&parkCode=ACAD&paramCode=Visibility&startYr=1990&endYr=2018&monitoringSite=ACAD1%20(IMPROVE)&timePeriod=Long-term

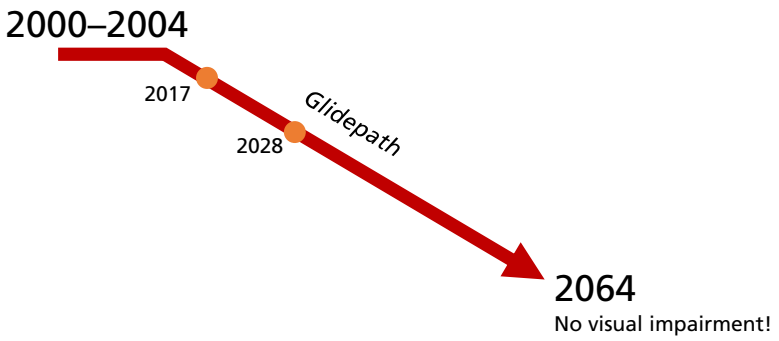
In the past ten years, monitoring data reveal an increase in the 20% most impaired days occurring during winter months. Looking at those 20% most impaired days in 2019, data show ammonium nitrates make up a good portion of that impairment. This reinforces the NPS perspective that nitrates are an important pollutant for reduction during the second planning period and should not be disregarded in state plans.

Question was asked about high-level of ammonium nitrate on a single day in Dec 2019. The circumstances of that particular day are not clear, but other monitoring data in region also indicate high levels of ammonium nitrate contribution to light extinction in winter in recent years (2018 and 2019). Because the Acadia NP monitoring station is regularly audited for quality assurance and the data have been validated NPS believes that this was a monitored event and not an error at the site.

Note, the graph on the left shows the moth-wise distribution of 20% most impaired days for the past 10 years. The graph on the right shows the daily extinction budget (pollutant contribution to light extinction) for each sample day in 2019.

Bar graphs from the IMPROVE webpage
Daily extinction budget graph: PM and Haze Composition (colostate.edu)
Month wise distribution of days graph: AQRV Summaries (colostate.edu)

Measuring Progress:



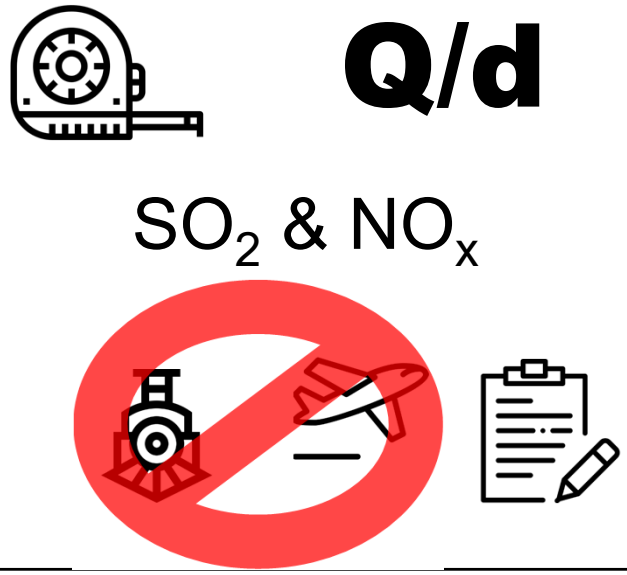
We are currently discussing emission sources for 2018-2028 – Second Planning Period

States' long-term strategies should continue to support visibility improvement in Class I areas in MANE-VU.

The second planning period should focus on how emissions from facilities will change between 2018 and 2028 and what additional measures states can take to continue to make progress toward the 2064 goal of no visual impairment.

National Park Service RHR-Round 2

- NPS participating in Regional Planning Organizations (MANE-VU)
  - NY, NJ, DC, CT, MA, DE, ME
  - *NH, MD, PA*
- Evaluated facilities for visibility impacts on our Class I areas
- Provided lists of facilities to states for 4-factor analysis consideration
- For NHDES:
  - 4 facilities on 2018 List
  - Updated 2021 List - 2 facilities



In 2018, NPS provided lists of facilities that impact Class I parks to states and Regional Planning Organizations

- We used a NPS Class I centric approach – i.e., we looked at impact of facilities on Acadia NP, Shenandoah NP, and other NPS managed Class I areas
- For each NPS Class I area, we identified those facilities associated with contributing 80% of visibility impacts, based on EPA's 2016/2018 guidance
- Calculated Q/d for sources within 1,000km of NPS Class I boundaries using SO_2 and $No_{x,}$
- PM is well controlled on stationary sources, difficult to control for remaining area sources (including mines)
- Removed rail yards and airports
- Adjusted our results to reflect those facilities that had been controlled, shut down, changed fuels, or that we knew would be controlled before 2028

NPS Notes:

- Reasonable for states to look more closely at NO_x for this round as SO_2 has significantly been reduced in most MANEVU states.
- NO_x emissions have increasing influence on visibility in the East, especially during the winter months (as previous slide show)
- With the MANE-VU recommended threshold of 3 inverse megameters, this threshold for source selection is too high and misses sources that are contributing significantly to visibility impairment in Class I areas including Acadia NP.
- The second and future planning periods rely on the cumulative benefits of smaller emission reductions to make progress.

★ *NH includes all four facilities in draft SIP*

NPS List – 2018 & 2021
NH Sources for Four Factor Analysis Consideration

Inventory	Facility Name	NO_x	SO_2	Q	Distance to NPS Class I Area	Q/d	NPS Class I Area
NEI	WHEELABRATOR CONCORD COMPANY LP	341	51	392	249	1.58	ACAD
CAMD	Burgess BioPower	248	18	266	207	1.28	ACAD
CAMD	Merrimack	164	96	260	247	1.06	ACAD
CAMD	Schiller	20	22	42	200	0.21	ACAD

Four-Factor Analyses

NPS ARD initially included four sources on our recommended list for four-factor analysis in 2018. Each of these four sources had a Q/d greater than 1.19 and contributed to 80% of visibility impairment at Acadia NP. We appreciate that New Hampshire addressed all four facilities in the draft SIP for FLM review.

We developed a 2021 list using updated emissions data (2017 NEI and CAMD 2020) and find that the two facilities highlighted in yellow now have Q/d < 1.19. Please consider these sources dropped from our list of facilities to consider for four factor analysis.

We are happy to say the remaining two facilities, Wheelabrator and Burgess BioPower, are very well controlled – especially Burgess Biopower which we'd like to inform you that we share as an example with other states. It's the best example of controlling NO_x from a biomass boiler with SCR.

We have no further comments on NHDES four-factor analyses.

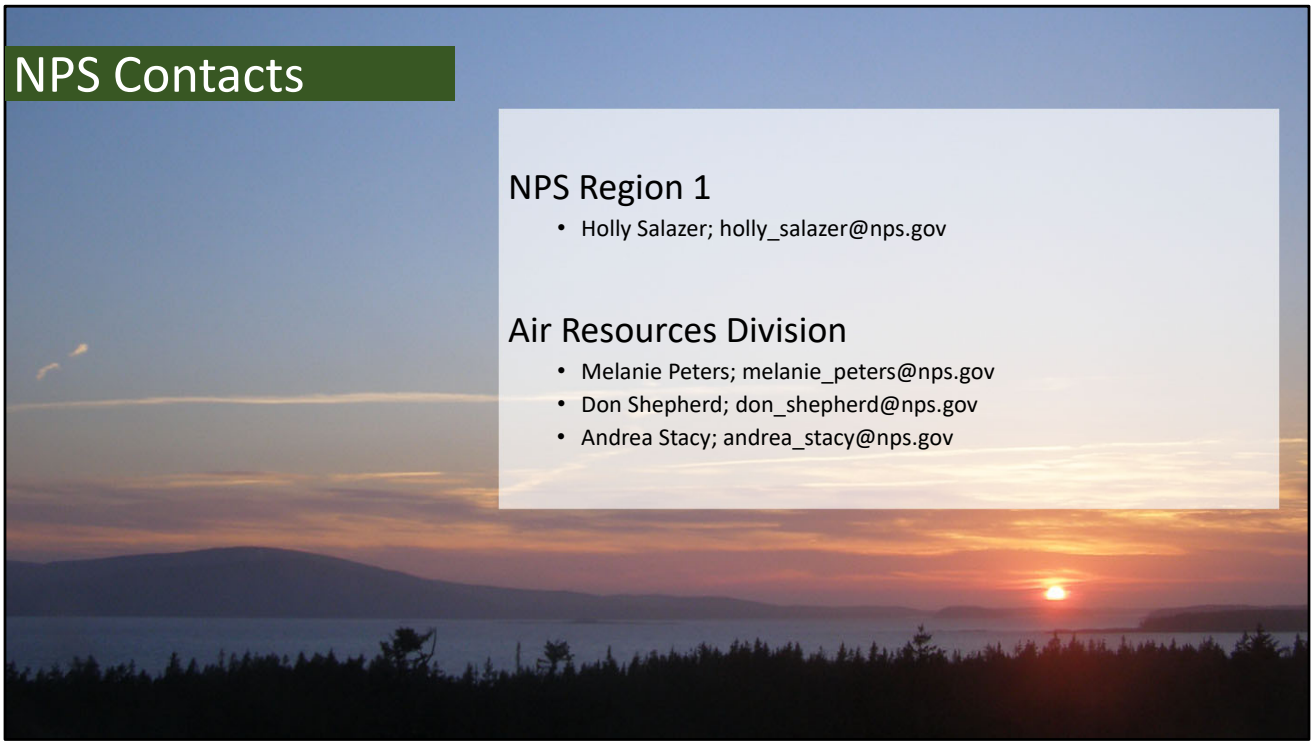
National Park Service RHR - Round 2

- Thank you for meeting with us!
- Please share:
  - Anticipated SIP schedule
  - How you will respond to NPS comments
- Please let us know:
  - When public comment period opens
  - If/when a public hearing will be held
- The NPS will:
  - Email call summary & any add'l information
  - Share our comments with EPA Region 1

The NPS will submit an email summary of our June 9, 2021 consultation call along with any final review comments by June 21, 2021.

The NPS requests that the state notify us when the draft SIP will be open for public review and comment, and alert us to any public hearing dates.

The NHDES agreed and confirmed NPS comments will be included in the public draft.



Please reach out to us with any questions.

For any formal notifications of public documents, please include the above list of NPS staff.

NPS acknowledges and very much appreciates the emission reductions that New Hampshire has made since the beginning of the Regional Haze program. We also see that there is still significant progress to be made before we can reach the goal of unimpaired visibility. We welcome future opportunities to engage with New Hampshire and work together on efforts to reduce haze causing pollution and promote clean air and clear views in our national parks.

NPS photo of Acadia NP, ME

USDA United States Department of Agriculture | Forest Service | White Mountain National Forest | 71 White Mountain Drive
Campton, NH 03223
603-536-6100

File Code: 2580
Date: June 16, 2021

Mr. Craig A. Wright
Director, Air Resources Division
New Hampshire Department of Environmental Services
29 Hazen Drive
Concord, NH 03302-0095

Dear Mr. Wright,

On April 21, 2021, the State of New Hampshire submitted a draft Regional Haze Plan Periodic Comprehensive Revision describing your proposal to continue improving air quality by reducing regional haze impacts at mandatory Class I areas across the region. We appreciate the opportunity over multiple years to work closely with the State of New Hampshire through the initial evaluation, development, and subsequent review of this plan. Cooperative efforts such as these ensure that, together, we will continue to make progress toward the Clean Air Act's goal of natural visibility conditions at our Class I areas.

This letter acknowledges that the U.S. Department of Agriculture, U.S. Forest Service, has received and conducted a substantive review of your proposed Regional Haze Plan Periodic Comprehensive Revision. This review satisfies your requirements under the federal regulations 40 C.F.R. § 51.308(i)(2). Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination about the document's completeness, and therefore, only the EPA has the authority to approve the document.

We are satisfied with the document as provided and offer no suggestions for change. For further information, please contact Ralph Perron at ralph.perron@usda.gov or Bret Anderson at bret.a.anderson@usda.gov.

Again, we appreciate the opportunity to work closely with the State of New Hampshire. The Forest Service compliments you on your hard work and dedication to significant improvement in our nation's air quality values and visibility.

Sincerely,

X _____

DEREK J.S. IBARGUEN
Forest Supervisor

cc: Shawn Olson, James Gries, Ralph Perron, Bret Anderson, Catherine Beahm, Lisa Camire, Jeff Underhill, Kathleen Errington, David Healy

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MICHAEL ABRACZINSKAS
Director

NORTH CAROLINA
Environmental Quality

February 23, 2022

Ms. Lisa Camire
SIP Planning Analyst
Air Resources Division
New Hampshire Department of Environmental Services
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Subject: New Hampshire Regional Haze Plan, Periodic Comprehensive Revision, DRAFT 12/05/2021

Dear Ms. Camire:

The North Carolina (NC) Division of Air Quality (DAQ) appreciates the opportunity to review of the *New Hampshire Regional Haze Plan, Periodic Comprehensive Revision, DRAFT 12/05/2021* which describes New Hampshire's long-term plan for addressing visibility-impairing pollution at the Great Gulf and the Presidential Range-Dry River (GGPRDR) Wilderness Areas for the second planning period (2019-2028). In Appendix W of the draft 2021 SIP, New Hampshire provides responses to my December 20, 2019, comments on the initial proposal of the *New Hampshire Regional Haze Plan, Periodic Comprehensive Revision, DRAFT 10-31-2019.* The DAQ appreciates the opportunity to review the responses and offers the following additional comments on the draft 2021 SIP before New Hampshire submits its final SIP to the U.S. Environmental Protection Agency (EPA).

I. Response to Mid-Atlantic/Northeast Visibility Union (MANE-VU) Inter-Regional Planning Organization (RPO) Ask

MANE-VU has acknowledged that North Carolina's regional haze SIP includes measures that address "emission management" strategies #1, #4, and #5 in its Inter-RPO Ask. In addition, as noted in New Hampshire's response to comments in its draft 2021 SIP, and in MANE-VU's comment letter on North Carolina's draft SIP, it is acknowledged that "emission management" strategy #2 does not apply to North Carolina.[1]

The remaining "emission management" strategy #3 concerns the adoption of an ultra-low sulfur fuel (ULSF) oil standard like the one adopted by MANE-VU states. Attachment 1 to this letter provides an evaluation of recent historical residual and distillate oil sales in the North Carolina. The data show that high sulfur fuel oil sales are (1) much lower in North Carolina relative to the MANE-VU states, and (2) steadily being replaced by ULSF sales in the absence of a state rule. From this information, the DAQ concludes that adopting an ULSF standard would yield very little reduction in sulfur dioxide (SO_2) emissions or any noticeable improvement in visibility in Class I areas in North Carolina and in downwind states. This is not a reasonable measure for North Carolina to adopt to improve visibility in Class I areas,

[1] Letter from Sharon Davis, New Jersey Department of Environmental Protection, David Healy, New Hampshire Department of Environmental Services, and Co-Chairs, MANE-VU Technical Support Committee, to Randy Strait, North Carolina DAQ providing comments on the "Pre-hearing draft of the Regional Haze State Implementation Plan (SIP) for North Carolina Class I Areas for the Second Planning Period (2019 – 2028)," October 12, 2021.

and I request that New Hampshire exclude this strategy for North Carolina from its modeling of any reasonable progress goals (RPGs) for the GGPRDR Wilderness Areas.

II. North Carolina Contribution to Visibility Impairment at the GGPRDR Wilderness Areas

In my December 20, 2019, comments on New Hampshire's draft 2019 SIP, I provided preliminary results showing North Carolina's statewide emissions contribution to visibility impairment at the GGPRDR Wilderness Areas is small by any metric or comparison. Subsequently, the visibility planning organization in which North Carolina participates, the Visibility Improvement - State and Tribal Association of the Southeast (VISTAS), finalized the analysis of visibility impacts for mandatory federal Class I areas in the VISTAS modeling domain.[2] Table 1 summarizes the final Particulate Source Apportionment Technology (PSAT) modeling results for North Carolina.[3] North Carolina's total sulfate plus nitrate contribution to total sulfate plus nitrate visibility impairment in 2028 for the GGPRDR Wilderness Areas is about 0.046 Mm^{-1} (0.31%) for the 20% most impaired days and 0.004 Mm^{-1} (0.11%) for the 20% clearest days. Thus, consistent with the draft results provided in my previous comments, these contributions illustrate that it is highly unlikely that North Carolina contributes ≥2% of the visibility impairment at the GGPRDR Wilderness Areas which MANE-VU used as the only criterion for including North Carolina in the Inter-RPO Ask. Attachment 2 provides the final PSAT modeling results associated with anthropogenic and natural sources contributions from each of the VISTAS' states, other RPOs, and boundary conditions to the GGPRDR Wilderness Areas.

Table 1. North Carolina Sulfate and Nitrate Statewide Contribution from All Sources in 2028 to GGPRDR Wilderness Areas for 20% Most Impaired Days (Mm^{-1})

	Total Impairment	Total Sulfate	Total Nitrate	Total Sulfate + Nitrate	Percentage of Total
20% Most Impaired Days					
Total for GGPRDR Wilderness Areas*	35.557	13.132	1.695	14.826	
North Carolina - Final	Not available	0.043	0.003	0.046	0.31%
20% Clearest Days					
Total for GGPRDR Wilderness Areas *	17.172	3.156	0.482	3.638	
North Carolina - Final	Not available	0.003	0.001	0.004	0.11%

* Total impairment represents the contribution from all pollutants and all emissions sources within the VISTAS modeling domain plus boundary contributions. The total sulfate and nitrate contribution is associated with all SO_2 and nitrogen oxide (NO_x) emissions sources within the VISTAS modeling domain plus boundary contributions.

[2] The VISTAS 12 Kilometer (Km) modeling domain is a subset of the Continental United States (CONUS) 12 Km domain. See Section 4.0 in the document titled, Regional Haze Modeling for Southeastern VISTAS II Regional Haze Analysis Project Final Modeling Protocol Update and Addendum to the Approved Modeling Protocol for Task 6.1 (June 2018), Final - August 31, 2020, available at https://www.metro4-sesarm.org/sites/default/files/VISTAS_Modeling_Protocol_Final_180627_addendum_20200831.pdf.

[3] Sulfate and nitrate were evaluated because these two pollutants currently account for most of the visibility impairment associated with anthropogenic sources in the VISTAS and MANE-VU regions.

In addition, I provide the following information to clarify key points regarding the use of 2028 emissions and 2011 meteorology for the VISTAS modeling analysis.

A. Use of 2028 Emissions Projections

In Appendix W of the draft 2021 SIP, New Hampshire provided the following response to a comment from Virginia (a VISTAS state) requesting that 2028 be the basis for contribution threshold analyses:

> *MANE-VU states discussed using 2028 as well as other years. It was decided that it made more sense for MANE-VU to use reported emissions from a recent year rather than to assume that emissions projected more than ten years into the future (at the time of the decision) would be accurate. Much of the emission reduction during recent years took place because of economic factors that are not locked in for 2028. Thus including these reductions in the starting point distorts results if the economics change prior to 2028. MANE-VU understands that facility fuel switches and shutdowns have, and will, occur since the MANE-VU analysis 2015 base year and prefer that this information be applied towards meeting the MANE-VU Ask.*

VISTAS used the Comprehensive Air Quality Model with Extensions (CAMx) and PSAT to model the most recent emissions inventory for 2011 and 2028 available at the beginning of the VISTAS regional haze work in late 2017. The analysis calculates 2028 impacts as recommended on page 17 of EPA's August 20, 2019 guidance memorandum which states:[4]

> *All of the techniques described above require estimates of source emissions. Generally, we recommend that states use estimates of 2028 emissions (resolved by day and hour, as appropriate) to estimate visibility impacts (or related surrogates) when selecting sources, rather than values of recent year emissions.*

The DAQ disagrees with New Hampshire's assessment that much of the emission reductions between 2011 and 2028 are due to "economic factors that are not locked in for 2028" and may "distort results if the economics change prior to 2028." Sulfates from SO_2 emissions and nitrates from nitrogen oxides (NO_x) emissions are the most impactful visibility impairing pollutants followed by organic matter from volatile organic compounds. Emissions of SO_2 and NO_x are decreasing in part due to the closure of coal-fired electricity generating units (EGU) in North Carolina and other states. These closures are not temporary, and the resulting emission reductions do not distort the 2028 emission estimates. All evidence, from data reported to the National Emissions Inventory to the Clean Air Markets Division, show that emissions of SO_2 and NO_x in North Carolina are decreasing. For North Carolina, SO_2 and NO_x emission reductions from coal-fired EGUs have been driven initially by the emissions caps required by the State's Clean Smokestacks Act and subsequently permanent replacement of coal units with natural gas units and renewable resources. Further, restarting or rebuilding coal-fired facilities in North Carolina would trigger prescriptive New Source Review permitting requirements that would undoubtedly require state-of-the-art controls for SO_2 and NO_x emissions. Emissions of NO_x are also decreasing due to stringent control programs applicable to nonroad and on-road engines. These control programs are not economic factors but rather federal and state requirements.

In addition, North Carolina (as well as the other VISTAS states) included only emission reductions in its 2028 emission estimates that are based on on-the-books or on-the-way controls and emission reductions

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[4] U.S. EPA, "Guidance on Regional Haze State Implementation Plans for the Second Implementation Period," EPA-457/B-19-003, August 20, 2019, page 17, accessed from https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period.

that can be supported by existing documentation, permits, laws, and regulations.[5] For North Carolina, the DAQ also applied growth factors to 2016 base year emissions for point sources to account for economic growth.[6] The 2028 projected emissions do not include speculative reductions such as unsubstantiated EGU shutdowns predicted by the Integrated Planning Model (IPM) or emission reductions from control programs listed in the MANE-VU Ask. This approach is consistent with the EPA's guidance for preparing emissions inventories to support regional haze modeling.[7,8] Therefore, it is completely reasonable for North Carolina to base its analysis on 2028 emissions that align with establishment of RPGs for 2028 and to incorporate permanent emission reductions that have occurred since 2015 (i.e., the year used by MANE-VU for its screening analysis).

B. Impact of Meteorology on 2028 RPGs

In its response to state comments on its draft 2019 SIP, New Hampshire noted a concern with the VISTAS modeling in that it relied on only one year (2011) of meteorology to support analysis of contribution assessments and modeling of RPGs for 2028. Base-year and future-year photochemical grid modeling (e.g., CAMx) only relies on one year of meteorological data to properly prepare the relative response factors for the base year and future year. It is inappropriate to model multiple base years of meteorology into multiple future years with the same future year's projected emissions. The EPA's 2018 modeling guidance specifically calls for -- and considers sufficient -- one year of meteorological data to be used in performing base and future-year photochemical grid modeling for regional haze planning purposes.[9] Further, when using the relative response approach as detailed in the 2018 modeling guidance,[10] the relative response factors that are computed from the modeled base and future years are applied to a five-year average of Interagency Monitoring of Protected Visual Environments (IMPROVE) monitor data for each visibility-impairing pollutant to compute what that future five-year average for the given pollutant may be.

In addition, for the 20% most impaired days, Table 2 compares the 2028 uniform rate of progress (URP) for the GGPRDR Wilderness Areas to the regional haze photochemical grid modeling results from VISTAS and MANE-VU (each using a 2011 base year and meteorology) and EPA and LADCO (each using a 2016 base year and meteorology). The four modeling studies predict impacts below the URP for the GGPRDR Wilderness Areas in 2028. VISTAS modeling shows an impact that is 0.17 deciview (dv) above the MANE-VU RPG estimate when using 2011 meteorology. When compared to the LADCO and EPA modeling using 2016 meteorology, the VISTAS modeling was 0.62 dv less and 0.13 dv higher than the LADCO and EPA RPGs, respectively. The modeling results are reasonably close given the different modeling platforms and year of meteorology data used in these studies. These results suggest that EPA's methodology to account for multiple years of monitoring data in developing the relative response factors used to calculate the 2028 RPGs mitigates the limitations of using a single year of meteorology.

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[5] Documentation of the 2028 emissions inventory (Task 2) and processing of the emissions for input to CAMx and PSAT modeling (Task 3) is provided on the VISTAS website at https://www.metro4-sesarm.org/content/vistas-regional-haze-program.

[6] Documentation of North Carolina's methods for projecting point source emissions from 2016 to 2028 is provided in Appendix B3 of the North Carolina reginal haze SIP.

[7] See reference 4.

[8] U.S. EPA, "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," EPA-454/B-17-002, May 2017, https://www.epa.gov/sites/production/files/2017-07/documents/ei_guidance_may_2017_final_rev.pdf.

[9] U.S. EPA, "Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5 and Regional Haze," EPA 454/R-18-009, November 2018, https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf. See page 20: "Choose time periods that reflect the variety of meteorological conditions that represent visibility impairment on the 20% clearest and 20% most impaired days in the Class I areas being modeled (high and low concentrations necessary). This is best accomplished by modeling a full year."

[10] See reference 9, see Section 5.3.

Table 2. Comparison of URP and Photochemical Grid Modeling of Visibility Impairment for the GGPRDR Wilderness Areas in 2028 for 20% Most Impaired Days

Conditions	Deciviews
Unadjusted Uniform Rate of Progress for 2028[11]	17.04
Modeled RPGs for 2028	
MANE-VU/OTC – CMAQ/2011 Meteorological Data[12]	12.13
VISTAS – CAMx/2011 Meteorological Data	12.30
EPA – CAMx/2016 Meteorological Data[13]	12.17
LADCO – CAMx/2016 Meteorological Data[14]	12.92

III. Conclusions

Based on the information provided in this and my previous 2019 letter, North Carolina has fulfilled its obligations under the MANE-VU Ask. Going forward, I would appreciate the opportunity for North Carolina and other VISTAS states to share methodologies and data during development of future regional haze SIPs with a goal to be as consistent as possible before MANE-VU states prepare an Ask of upwind states. Doing so will avoid inconsistencies between methodologies and data sets, ensure that the best data are used to support modeling and decision making, and enable states to focus on sectors and emission sources for further analysis that will benefit improvements in visibility in all Class I areas in North Carolina and MANE-VU Class I areas.

Thank you for the opportunity to comment on New Hampshire's draft regional haze SIP. I hope that these comments are helpful, and I look forward to continuing to work with you and the MANE-VU states to develop reasonable regional haze SIPs in the future. Please contact Randy Strait (randy.strait@ncdenr.gov) of my staff at 919-707-8721 if you have any questions regarding this matter.

Sincerely,

Michael A. Abraczinskas, Director
Division of Air Quality, NCDEQ

MAA/rps

Attachments

cc: Michael Pjetraj, NCDAQ
Tammy Manning, NCDAQ
Randy Strait, NCDAQ

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[11] From Table 1-2 of New Hampshire's Regional Haze Plan, Periodic Comprehensive Revision, DRAFT 12/05/2021 (file named "r-ard-21-02_SIP.pdf").
[12] Modeled without the MANE-VU Ask measures, see Table 4-6 of New Hampshire's Regional Haze Plan, Periodic Comprehensive Revision, DRAFT 12/05/2021 (file named "r-ard-21-02_SIP.pdf").
[13] U.S. EPA, from Table 3-2 in "Technical Support Document for EPA's Updated 2028 Regional Haze Modeling," Office of Air Quality Planning and Standards, September 2019, https://www.epa.gov/visibility/technical-support-document-epas-updated-2028-regional-haze-modeling.
[14] https://www.ladco.org/wp-content/uploads/Projects/Regional-Haze/Round2/LADCO_RegionalHaze_2016_28abc_PSAT_Charts_05June2021.xlsx

Attachment 1

Evaluation of MANE-VU Inter-RPO Ask Emission Management Strategy #3 (Ultra-low Sulfur Fuel Oil Standard) for North Carolina

For emission management strategy #3, the Inter-RPO Ask states that:

> *"States should pursue an ultra-low sulfur fuel oil standard similar to the one adopted by MANE-VU states in 2007 as expeditiously as possible and before 2028, depending on supply availability, where the standards are as follows:*
> *a. distillate oil to 0.0015% sulfur by weight (15 ppm),*
> *b. #4 residual oil to 0.5% sulfur by weight,*
> *c. #6 residual oil to 0.5% sulfur by weight."*

The DAQ has reviewed this request and evaluated residual and distillate oil use in the state. Based on this evaluation, North Carolina concludes that adopting an ULSF standard would yield very little reduction in SO_2 emissions or any noticeable improvement in visibility in Class I areas in North Carolina and in downwind states for the following reasons:

- Residual oil sales in North Carolina for 2019 were very low in comparison to distillate oil. The only uses for this fuel are industrial and large marine vessel bunkering. From 2005 through 2019, overall residual oil usage has been in sharp decline, particularly in the industrial sector where usage has dropped 98%.[15] Residual oil usage in North Carolina is less than 2% of that of the MANE-VU region.[16]
- Distillate oil sales in North Carolina have been relatively steady from 2014-2019, and ULSF for highway and off-highway use make up a large majority of the distillate oil used in North Carolina.[17] When considering distillate oil usage aside from highway and off-highway transportation (which is already using ULSF), North Carolina uses roughly 5% of the amount used by the MANE-VU region and less than 4% of all non-transportation distillate oil on the East Coast.[18]
- Residential heating oil use in North Carolina has never been considerable, and it has continued to decline over time.[19] Less than 3% of homes in North Carolina are heated with oil, as of 2019.[20] The U.S. Energy Information Administration (EIA) data for 2019 states that 86% of residential heating oil in the United States is consumed by states within the MANE-VU RPO.[21]

As such, it is completely reasonable to include a requirement in the Intra-RPO Ask for the MANE-VU states to restrict the sulfur content in fuel oil sales. However, to extend this requirement to an Inter-RPO Ask of North Carolina where the use of residual and distillate oil is significantly lower relative to the use of these fuels in the MANE-VU states is not reasonable. In addition, as shown in Table A-1, ULSF already makes up 95-98% of the distillate oil supplied to the east coast in 2018 and 2019, the latest year for which data are available. This percentage has been above 85% since 2015 and is trending toward 100%.[22] Based on this information and the continued trend toward the use of ULSF, the DAQ concludes that adopting an ULSF standard for North Carolina will not provide any additional SO_2 emission reductions above and beyond what would occur in the absence of a standard.

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[15] https://www.eia.gov/dnav/pet/pet_cons_821rsda_dcu_SNC_a.htm
[16] https://www.eia.gov/dnav/pet/pet_cons_821rsda_a_EPPR_VAA_Mgal_a.htm
[17] https://www.eia.gov/dnav/pet/pet_cons_821dst_dcu_SNC_a.htm
[18] https://www.eia.gov/dnav/pet/pet_cons_821dsta_a_EPD0_VAA_Mgal_a.htm
[19] https://www.eia.gov/dnav/pet/pet_cons_821use_dcu_SNC_a.htm
[20] https://www.eia.gov/state/print.php?sid=NC
[21] https://www.eia.gov/energyexplained/heating-oil/use-of-heating-oil.php
[22] https://www.eia.gov/dnav/pet/pet_cons_psup_dc_r10_mbbl_a.htm

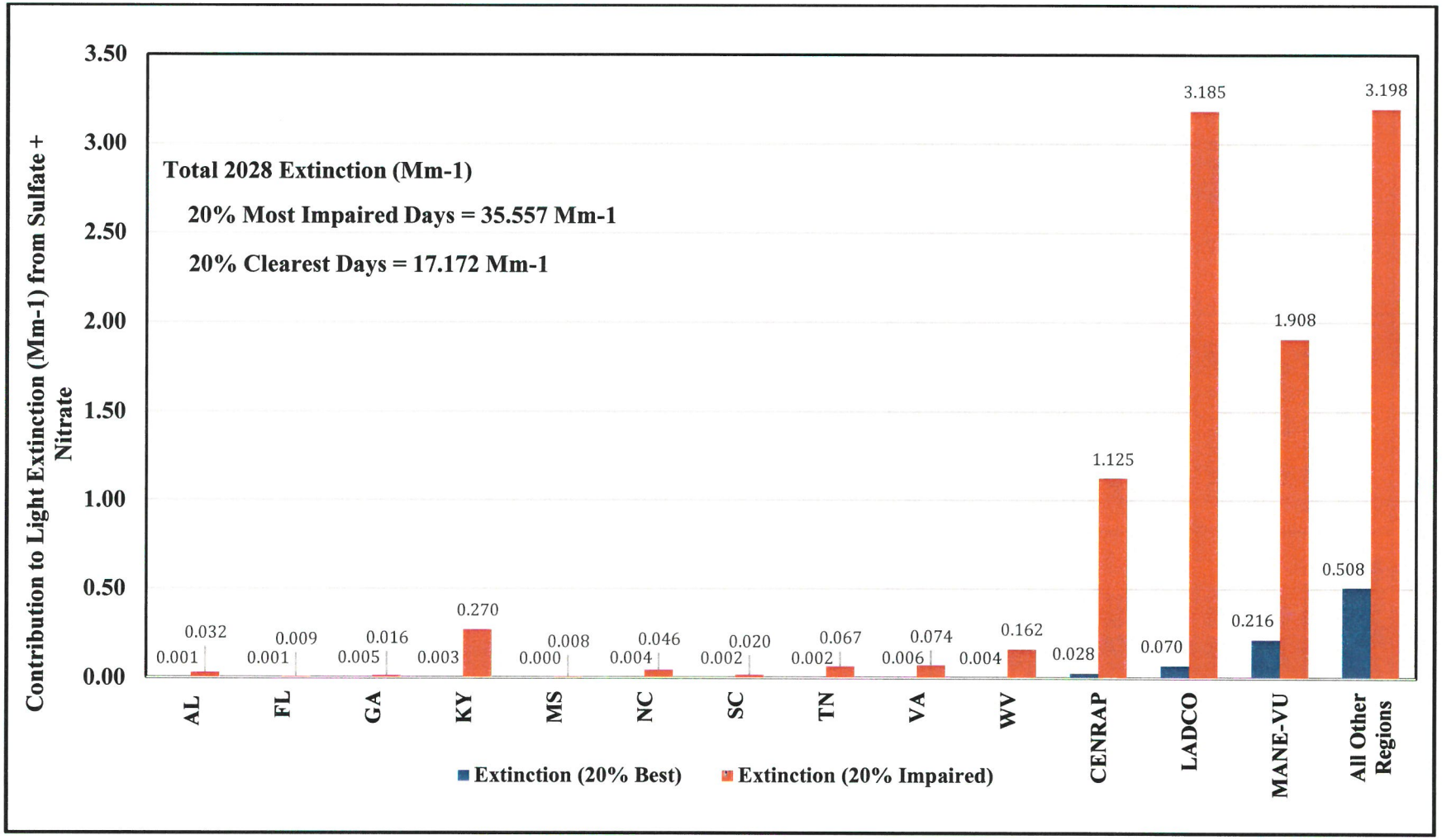
Table A-1. Distillate Fuel Oil Supplied to East Coast by Sulfur Content, Past 10 Years

Year	Total Distillate Fuel Oil Thousand Barrels	0 to 15 ppm Sulfur Thousand Barrels (% of Total)	15 to 500 ppm Sulfur Thousand Barrels* (% of Total)	Greater Than 500 ppm Sulfur Thousand Barrels (% of Total)
2011	421,189	310,672 (73.8%)	-1,480 (-0.4%)	111,997 (26.6%)
2012	396,682	309,666 (78.1%)	-2,348 (-0.6%)	89,364 (22.5%)
2013	430,636	342,427 (79.5%)	-2,064 (-0.5%)	90,273 (21.0%)
2014	453,617	380,239 (83.8%)	1,820 (0.4%)	71,558 (15.8%)
2015	452,928	395,670 (87.4%)	3,467 (0.8%)	53,792 (11.9%)
2016	430,349	378,159 (87.9%)	3,194 (0.7%)	48,996 (11.4%)
2017	435,768	382,973 (87.9%)	2,645 (0.6%)	50,150 (11.5%)
2018	461,109	426,126 (92.4%)	7,353 (1.6%)	27,630 (6.0%)
2019	452,565	431,424 (95.3%)	1,660 (0.4%)	19,481 (4.3%)
2020	425,050	415,098 (97.7%)	450 (0.1%)	9,502 (2.2%)

* Amounts shown are net volumes supplied to the region. Negative values represent years when various factors, including exports, have resulted in net negative volumes supplied.

Attachment 2

2028 Contribution to Light Extinction of All Anthropogenic and Natural Sources to GGPRDR Wilderness Areas, NH from Sulfate + Nitrate (Mm-1) from Final VISTAS Regional Haze Modeling Analysis



Commonwealth of Virginia

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February 23, 2022

Ms. Lisa Camire
Air Resources Division
New Hampshire Department of Environmental Services
29 Hazen Drive
PO Box 95
Concord, NH 03302-0095

Dear Ms. Camire,

Thank you for providing the Virginia Department of Environmental Quality (DEQ) the opportunity to comment on your proposed Regional Haze State Implementation Plan (SIP), *New Hampshire Regional Haze Plan Periodic Comprehensive Revision DRAFT 12/05/2021.* This proposal describes New Hampshire's long term plan for addressing visibility-impairing pollution at the Great Gulf (GRGU) Wilderness Area and the Presidential Range-Dry River (PRDR) Wilderness Area. DEQ disagrees with many aspects of the technical analysis for this next planning period as provided in your proposal. DEQ recommends that New Hampshire's assessment of the reasonable progress goals (RPGs) for these areas not rely on speculative Virginia emission reductions stemming from the *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)* (MANE-VU "Ask").

On December 20, 2019, DEQ offered comments on the initial proposal of this document, the *New Hampshire Regional Haze Plan Periodic Comprehensive Revision DRAFT 10-31-2019.* These comments are included as Attachment 1. This first set of

comments questioned the MANE-VU analysis. In particular DEQ questioned the use of a three inverse megameter (Mm^{-1}) threshold applied to CALPUF analysis results where the emissions were based on the 95th percentile of daily 2015 emissions at electrical generating units (EGUs). The relationship between the 95th percentile of daily 2015 emissions at any particular stack and the regulatory standard of the 20% most impaired days is unclear and should be thoroughly explained within the New Hampshire SIP. In 2019, the visibility planning organization in which Virginia participates, the Visibility Improvement - State and Tribal Association of the Southeast (VISTAS), had not yet finalized the analysis of visibility impacts for mandatory federal Class I areas in the continental U.S. DEQ did share draft final results in the 2019 comment letter. Since then, that analysis has been completed. The analysis used CAMx (PSAT) modeling and the most recent emissions inventory for 2011 and 2028 available at the beginning of the work. The analysis calculates 2028 impacts as recommended by the August 20, 2019, U.S. Environmental Protection Agency (EPA) guidance memorandum, *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period* (2019 EPA memo). The 2019 EPA memo states on page 17:

> All of the techniques described above require estimates of source emissions. Generally, we recommend that states use estimates of 2028 emissions (resolved by day and hour, as appropriate) to estimate visibility impacts (or related surrogates) when selecting sources, rather than values of recent year emissions.

Note that Virginia (as well as the other VISTAS states) included only emission reductions in the 2028 estimates that are based on on-the-books or on-the-way controls and emission reductions that can reasonably be supported by existing documentation, permits, laws, and regulations. VISTAS emissions inventories technical support documents may be found on the Metro 4/SESARM website.[1] They do not include speculative reductions such as unsubstantiated EGU shutdowns predicted by the Integrated Planning Model (IPM) or emission reductions from control programs listed in the MANE-VU "Ask."

In Appendix W of the proposed New Hampshire SIP dated 2021, New Hampshire Department of Environmental Services (NHDES) responded to the DEQ comment requesting that 2028 be the basis for contribution threshold analyses with the following:

> The VADEQ preference for using emissions projected to 2028 is logical; MANE-VU states discussed using 2028 as well as other

[1] url: https://www.metro4-sesarm.org/content/task-2-emission-inventory-updates

years. It was decided that it made more sense for MANE-VU to use reported emissions from a recent year rather than to assume that emissions projected more than ten years into the future (at the time of the decision) would be accurate. Much of the emission reduction during recent years took place because of economic factors that are not locked in for 2028. Thus including these reductions in the starting point distorts results if the economics change prior to 2028. MANE-VU understands that facility fuel switches and shutdowns have, and will, occur since the MANE-VU analysis 2015 base year and prefer that this information be applied towards meeting the MANE-VU Ask

DEQ disagrees with the assessment that much of the emission reductions between 2011 and 2028 are due to "economic factors that are not locked in for 2028" and may "distort results if the economics change prior to 2028." Sulfates from sulfur dioxide (SO_2) emissions are the most impactful visibility impairing pollutant, followed closely by nitrates from nitrogen oxides (NO_X) and organic matter from volatile organic compounds (VOC). Emissions of SO_2 and NO_X are decreasing in part due to the closure of coal-fired facilities. These closures are not temporary, and the resulting emission reductions do not distort the 2028 emission estimates. All evidence, from data reported to the National Emissions Inventory to the Clean Air Markets Division, shows that emissions of SO_2 and NO_X in Virginia are decreasing. Further, restarting or rebuilding coal-fired facilities in Virginia triggers prescriptive New Source Review permitting requirements that would likely require state-of-the-art controls for SO_2 and NO_X emissions. Emissions of NO_X are also decreasing due to control programs applicable to non-road and on-road engines. These control programs are not economic factors but rather federal mandates. New Hampshire's rationale for not following clear federal guidance in the 2019 EPA memo regarding the use of 2028 in reasonable progress analyses is therefore unsupported.

Visibility impairment projections from the final VISTAS 2028 analysis are provided in Table 1. This table presents the total projected impairment in 2028 from the contribution of all pollutants and all emission sources within the VISTAS modeling domain plus boundary contributions to the GRGU and PRDR Wilderness Areas in the column called, "Total Impairment (Mm^{-1})." This table also shows the total sulfate and nitrate contributions to these areas associated with the SO_2 and NO_X emission sources within the VISTAS modeling domain plus boundary contributions as well as the contributions for Virginia singularly. These data are in the columns called "Total Sulfate Impairment (Mm^{-1})" and

"Total Nitrate Impairment (Mm^{-1})." Virginia's total sulfate plus nitrate impairment to GRGU and PRDR Wilderness Areas is 0.074 Mm^{-1} on 20% most impaired days and 0.006 Mm^{-1} on 20% clearest days, equating to 0.50% and 0.16% of total sulfate plus nitrate impairment at these areas, respectively.

Table 1: Virginia Sulfate and Nitrate Contribution From All Sources in 2028 to GRGU, PRDR Wilderness Areas

Metric	Area	Total Impairment (Mm^{-1})	Total Sulfate Impairment (Mm^{-1})	Total Nitrate Impairment (Mm^{-1})	Total Sulfate + Nitrate Impairment (Mm^{-1})
20% Most Impaired Days	Total for GRGU, PRDR Wilderness Areas	35.557	13.132	1.695	14.826
20% Most Impaired Days	Virginia	not available	0.065	0.009	0.074
20% Clearest Days	Total for GRGU, PRDR Wilderness Areas	17.172	3.156	0.482	3.638
20% Clearest Days	Virginia	not available	0.005	0.001	0.006

Attachment 2 provides the final PSAT modeling results associated with anthropogenic and natural source contributions from each of the VISTAS' states, other regional planning organizations, and the boundary conditions to the GRGU and PRDR Wilderness Areas. More information on this 2028 contribution analysis is available on the Metro 4/SESARM website.[2]

These impacts are small by any metric or comparison. Virginia emissions do not impact New Hampshire Class I areas to any appreciable extent, and thus Virginia emissions cannot reasonably be screened into any type of reasonable progress analysis for New Hampshire Class I areas. Therefore, Virginia does not have an obligation to provide four factor analyses or other information in support of the MANE-VU "Ask" or in support of New Hampshire Class I areas' RPGs.

Also, federal regulations and EPA guidance support the use of federally enforceable limitations within the long term strategy rather than speculative emission reductions. 40 CFR Part 51.308(f)(2) notes:

[2] url: https://www.metro4-sesarm.org/content/task-7-source-apportionment-modelingtagging

> *Long-term strategy for regional haze.* Each State must submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I Federal area within the State and for each mandatory Class I Federal area located outside the state that may be affected by emissions from the State. The long-term strategy must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress, …

The 2019 EPA memo discusses this issue under footnote 80 on page 46:

> …If another contributing state has not yet even determined the measures that are necessary to make reasonable progress at the jointly affected Class I area, then the state with the Class I area must set the PRGs based on whatever measures that the contributing state has actually adopted to meet the requirements for the first implementation period and other CAA requirements. The state with the Class I area may not base its RPG on speculation about what another state will do. …

Due to Virginia's lack of meaningful impact on New Hampshire Class I areas, DEQ has no obligation to undertake any control analyses or four factor analyses in support of the New Hampshire Class I area RPGs for this second round of planning. Therefore, DEQ strongly recommends that New Hampshire's RPGs only reflect on-the-books and on-the-way controls in Virginia and exclude any speculative control programs for Virginia such as those listed in the MANE-VU "Ask." Using any other approach would be contrary to the 2019 EPA memo and regulatory text.

Sincerely,

Thomas R. Ballou
Director, Air Data Analysis and Planning

Attachment 1
Virginia DEQ Comments on the NH Proposed SIP dated December 20, 2019

Commonwealth of Virginia

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David K. Paylor
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December 20, 2019

Mr. Craig Wright, Director
New Hampshire Department of Environmental Services
Air Resources Division
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Dear Mr. Wright,

Thank you for providing the Virginia Department of Environmental Quality (DEQ) the opportunity to comment on your proposed Regional Haze State Implementation Plan (SIP), *New Hampshire Regional Haze Plan Periodic Comprehensive Revision DRAFT 10-31-2019.* This proposal describes New Hampshire's long term plan for addressing visibility-impairing pollution at the Great Gulf Wilderness Area and the Presidential Range-Dry River Wilderness Area. DEQ does not agree with all aspects of the technical analysis for this next planning period as provided in your proposal. DEQ also recommends that New Hampshire's assessment of the reasonable progress goals (RPGs) for these areas not rely on emission reductions from certain controls, as described in Section 4.2.4 of this proposal.

Section 2 in the proposal describes the screening process for evaluation of additional controls to determine which states should be the subject of consultation and should employ emission control programs. This screening process includes the use of emissions estimates divided by distance (Q/d) and CALPUFF results. Figure 2.4 shows the estimated 2011-2015 percent mass-weighted sulfate and nitrate contribution from Virginia to be just over 2% at New Hampshire's Class I areas. Table 2-2 provides data on electrical generating units (EGUs), relying on CALPUFF results and 2015 Clean Air Markets Division (CAMD) hourly emissions estimates to evaluate estimated contributions to visibility impairment at Great Gulf Wilderness Area. This table lists the estimated extinction contribution from Yorktown Power Station Unit #3 to be 3.6 inverse megameters (Mm^{-1}) and from Yorktown Power Station Units #1 and #2 to be 1.5 Mm^{-1}.

DEQ does not believe that such screening methodologies for the evaluation of reasonable progress should be based on 2011 emissions and 2015 CAMD EGU emissions. Rather, 2028 emission projections should be used for such evaluations. On August 20, 2019, the U.S. Environmental Protection Agency (EPA) published a guidance memorandum, *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*. The EPA guidance states on page 17:

> All of the techniques described above require estimates of source emissions. Generally, we recommend that states use estimates of 2028 emissions (resolved by day and hour, as appropriate) to estimate visibility impacts (or related surrogates) when selecting sources, rather than values of recent year emissions.

DEQ recommends that New Hampshire base any evaluation of visibility impact at its Class I areas on 2028 estimates of emissions. Using 2028 emission estimates will ensure that the latest information concerning plant closures, controls, fuel switches and other impacts are considered within the screening process. Additionally, such changes could impact percent contributions.

For example, use of 2028 emission estimates rather than 2015 emission estimates could change conclusions concerning Yorktown Power Station. Units #1 and #2 have retired. Yorktown #3 is an 882 MW oil-fired EGU located in Yorktown, Virginia, over 400 miles straight line distance from Great Gulf Wilderness Area. The unit is subject to 40 CFR Part 63 Subpart UUUUU *National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units* (MATS rule). Under the MATS rule, the unit operates as a limited-use, liquid oil-fired unit such that its annual capacity factor is less than 8%, averaged over a 24-month period. While capable of generating a significant amount of electricity, the unit operates infrequently. The following table provides the annual SO_2 emissions for 2013-2018 from this unit:

Table 1: Yorktown #3 SO2 Emissions from CAMD

Year	SO_2 Emissions, tpy
2013	399
2014	909
2015	2,070
2016	635
2017	269
2018	821

For this unit, ERTAC 16.0 results estimate 2028 SO_2 emissions to be approximately 368 tpy. IPM 6.0 results for both 2023 and 2030 estimate no activity or emissions from this unit. Dominion Energy's Integrated Resource Plan for 2018 indicates the unit may retire

in 2022.[1] Emissions data from 2015 used in the New Hampshire analysis are significantly higher than any of these estimates of 2028 activity.

Therefore, DEQ strongly recommends that New Hampshire's analysis rely upon 2028 emission estimates, both for Q/d analyses and for visibility impairment analyses, so that such estimates can take into account current knowledge of units, expected controls and growth in certain sectors, and the relative magnitudes of future year emissions from other sources and states.

Also important to note is that estimates of impact developed by the Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) for the southeastern states' Regional Haze submittals show 0.082 Mm^{-1} as the sulfate and nitrate contribution to light extinction from all anthropogenic sources within Virginia in 2028 to the Great Gulf Wilderness Area. This value, based on recently completed CAMx (PSAT) modeling, equates to 0.62% of the total anthropogenic visibility impairment estimated for 2028 at Great Gulf Wilderness Area. Based on this analysis, which relies on state-of-the-science modeling techniques and 2028 inventory projections as recommended by EPA guidance, the entirety of Virginia's 2028 emissions are estimated to contribute much less than 2% to visibility impairment at Great Gulf Wilderness Area. All of Virginia should be screened out based on the VISTAS projections using the New Hampshire visibility impact contribution threshold.

Virginia supports the VISTAS approach of using PSAT in CAMx as opposed to CALPUFF because CAMx is considered to have more robust chemistry (both gas and aqueous phase). In addition, improved spatial and temporal representation of ammonia and nitric acid concentrations, combined with inorganic chemistry in CAMx, allow for more realistic nitrate partitioning between the gas and particle phases. Finally, CALPUFF, a Langrangian puff model, has a tendency to over-predict impacts at large downwind distances when compared to an Eulerian photochemical grid model such as CAMx. These considerations are especially important given the distances between Virginia facilities such as Yorktown Power Station and the Great Gulf Wilderness Area or the Presidential Range-Dry River Wilderness Area.

Also of concern to DEQ are the proposed Great Gulf Wilderness Area and Presidential Range – Dry River Wilderness Area RPGs. In Figure E-1, the listed RPG for 2028 is 12.0 dv. In Table 4-6 and Table 4-10, the listed RPG is 12.00 dv based on emissions estimates that include MANE-VU Ask measures and 12.13 based on projections exclusive of MANE-VU Ask measures. If the RPG for these areas is projected from a platform considering only on-the-books and on-the-way controls, DEQ recommends clarifying the numerical value for the RPG for these areas and clearly documenting the use of that approach in these tables and the document's text. However, if the RPG for these Class I areas includes Virginia emissions reductions derived from the MANE-VU

[1] *Virginia Electric and Power Company's Report of Its Integrated Resource Plan*, Dominion Energy, May 1, 2018, Page 42.

Ask as described in Section 4.2.4, the RPG should be recalculated omitting such reductions. The emission control measures listed in the MANE-VU Ask are currently not federally enforceable in Virginia. At this time, whether or not these control measures or other control measures will be included in Virginia's SIP is unclear since DEQ has not finalized its screening methodology or notified facilities of the need to submit a four-factor analysis. Further, some of the listed control measures are unlikely to be included in Virginia's Regional Haze SIP. For example, currently DEQ has no plans to pursue sulfur content limitations in fuel oil for a number of reasons, some of which are supplied in the Virginia October 21, 2019, comment letter to New Jersey on that state's Regional Haze SIP proposal.

Federal regulations and EPA guidance support the use of federally enforceable limitations within the long term strategy. 40 CFR Part 51.308(f)(2) notes:

> *Long-term strategy for regional haze.* Each State must submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I Federal area within the State and for each mandatory Class I Federal area located outside the state that may be affected by emissions from the State. The long-term strategy must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress, ...

The EPA guidance discusses this issue under footnote 80 on page 46:

> ...If another contributing state has not yet even determined the measures that are necessary to make reasonable progress at the jointly affected Class I area, then the state with the Class I area must set the PRGs based on whatever measures that the contributing state has actually adopted to meet the requirements for the first implementation period and other CAA requirements. The state with the Class I area may not base its RPS on speculation about what another state will do. ...

Therefore, DEQ recommends that the RPG for these Class I areas rely on a platform that considers only reductions from on-the-books and on-the-way federally enforceable measures. Otherwise, the RPG selected by New Hampshire will be inconsistent with federal regulation and guidance since the projected value is based on speculative emission reductions that are not enforceable.

Again, thank you for this opportunity to comment.

Sincerely,

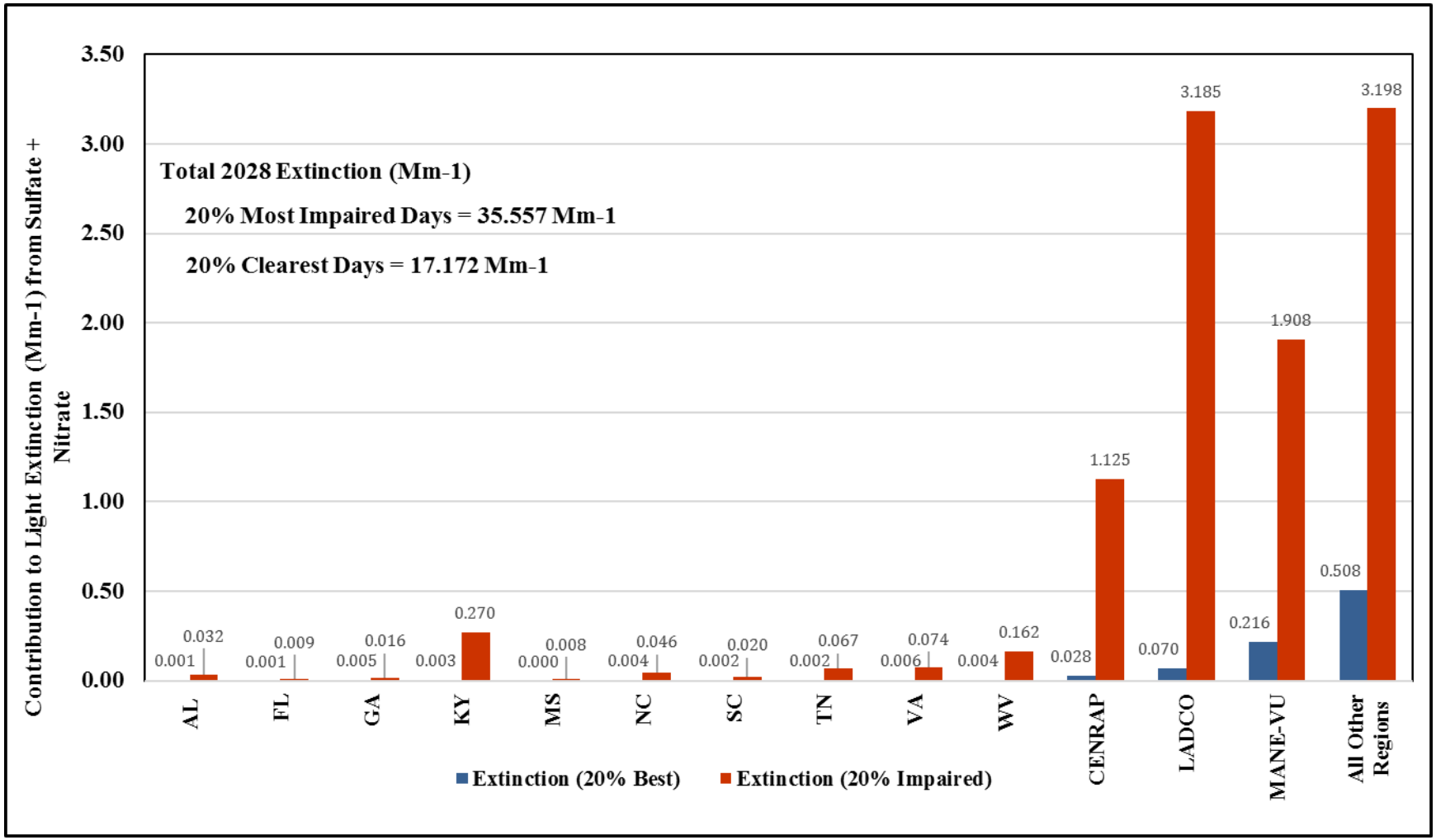
Thomas R. Ballou
Director, Air Data Analysis and Planning

TRB/dam

cc: Ms. Susan Spielburger, U.S. EPA
Mr. John Hornback, Metro-4/SESARM

Attachment 2

2028 Contributions to Light Extinction of All Anthropogenic and Natural Sources to GRGU and PRDR Wilderness Areas



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February 24, 2022

Via Electronic Mail to Lisa.J.Camire@des.nh.gov

Re: Comments on New Hampshire's Regional Haze Plan Periodic Comprehensive Revision

Dear Lisa J. Camire,

Sierra Club, the National Parks Conservation Association, Appalachian Mountain Club, and Conservation Law Foundation submit these comments addressing in part the New Hampshire Department of Environmental Services'("DES") draft Regional Haze Plan Periodic Comprehensive Revision (the "Draft Revision"). As discussed in more detail below, the Draft Revision's proposed reliance on the reasonably available control technology ("RACT") determination for NOx emission limits for Merrimack Station is flawed and improper, both because the 0.22 lbs NOx/MMbtu limit is inconsistent with RACT, and because the coal-fired units at Merrimack have demonstrably achieved far lower NOx emission rates in actual practice. Use of this limit is thus legally insupportable. Likewise, the Draft Revision's failure to incorporate and render enforceable the recent low capacity factors at both Merrimack and Schiller Station threatens to impede if not reverse progress in improving visibility in New Hampshire's Class I areas. Finally, DES should incorporate both climate and environmental justice concerns in the final Regional Haze plan New Hampshire submits to EPA.

Background

To improve air quality in our most treasured landscapes, Congress passed the visibility protection provisions of the Clean Air Act in 1977, establishing "as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in the mandatory class I Federal areas which impairment results from manmade air pollution."[1] "Manmade air pollution" is defined as "air pollution which results directly or indirectly from human activities."[2] In order to protect Class I areas' "intrinsic beauty and historical and archeological treasures," the regional haze program establishes a national regulatory floor and requires states to design and implement programs to curb haze-causing emissions within their jurisdictions. Each state must submit for EPA review a SIP designed to make reasonable progress toward achieving natural visibility conditions.[3]

A regional haze SIP must provide "emissions limits, schedules of compliance and other measures as may be necessary to make reasonable progress towards meeting the national goal."[4] Two of the most critical features of a regional haze SIP are the requirements for installation of Best Available Retrofit Technology ("BART") limits on pollutant emissions *and a long-term strategy for making reasonable progress toward the national visibility goal*.[5] Although many states addressed the Clean Air Act's BART requirements in their initial regional haze plans, EPA's 2017 revisions to the Regional Haze rule make clear that BART was not a once-and-done requirement. Indeed, states "will need" to reassess "BART-eligible sources that installed only moderately effective controls (or no controls at all)" for any additional technically-achievable controls in the second planning period.[6] The Haze requirements in the Clean Air Act present an unparalleled opportunity to protect and restore regional air quality by curbing visibility-impairing emissions from a variety of polluting sources.

Implementing the regional haze requirements promises benefits beyond improving views. Pollutants that cause visibility impairment also harm public health. For example, oxides of nitrogen ("NOx") are a precursor to ground-level ozone which is associated with respiratory disease and asthma attacks. NOx also reacts with ammonia, moisture and other compounds to form particulates that can cause and/or worsen respiratory diseases, aggravate heart disease, and lead to premature death. Similarly, sulfur dioxide ("SO_2") increases asthma symptoms, leads to increased hospital visits, and can also form particulates. NOx and SO_2 emissions also harm terrestrial and aquatic plants and animals through acid rain as well as through deposition of nitrates (which in turn cause terrestrial and aquatic ecosystem changes due to excess nitrogen).

In addition, the BART Guidelines explain that the term "non-air quality environmental impacts" should be interpreted broadly by states crafting Regional Haze plans. Climate change and environmental justice impacts are the types of non-air quality impacts that states should

[1] 42 U.S.C. § 7491(a)(1).
[2] *Id.* § 7491(g)(3).
[3] *Id.* § 7491(b)(2).
[4] 42 U.S.C. § 7491(b)(2).
[5] *Id.* § 7491(b)(2)(B); 40 C.F.R. § 51.308(d)(1)(i)(B).
[6] 82 Fed. Reg. 3078, 3,083 (Jan. 10, 2017); *see also id.* at 3,096 ("states must evaluate and reassess all elements required by 40 CFR 51.308(d)").

consider when they determine reasonable progress measures for specific sources. Incorporating climate change and environmental justice impacts into the regional haze analysis will further states' climate and environmental justice policy goals, and it will also help states ensure that their actions related to regional haze planning support their other work on climate and environmental justice issues. Most of the same sectors and sources implicated under the regional haze program are also implicated in climate and environmental justice initiatives. As a result, when states determine "the emissions reduction measures that are necessary to make reasonable progress," they should assess how those measures will either reduce or exacerbate greenhouse gas emissions and/or environmental justice impacts on nearby disproportionately burdened communities.

Requirements for Periodic Comprehensive Revisions for Regional Haze SIPs

In developing its long-term strategy, a state must consider its anthropogenic sources of visibility impairment and evaluate different emission reduction strategies including and beyond those prescribed by the BART provisions.[7] A state should consider "major and minor stationary sources, mobile sources and area sources."[8] At a minimum, a state must consider the following issues in developing its long-term strategy:

> (A) Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment;
> (B) Measures to mitigate the impacts of construction activities;
> (C) Emissions limitations and schedules for compliance to achieve the reasonable progress goal;
> (D) Source retirement and replacement schedules;
> (E) Smoke management techniques for agriculture and forestry management purposes including plans as currently exist within the State for these purposes;
> (F) Enforceability of emission limitations and control measures; and
> (G) The anticipated net effect on visibility due to projected changes in point, area, and mobile emissions over the period addressed by the long-term strategy.[9]

Additionally, states are required to examine four factors—they

> [M]ust must evaluate and determine the emission reduction measures that are necessary to make reasonable progress by considering the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected anthropogenic source of visibility impairment. . . . [and] must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy.[10]

[7] 40 C.F.R. § 51.308(f).
[8] *Id.* § 51.308(f)(2)(i).
[9] *Id.* § 51.308(f)(2)(iv).
[10] 40 C.F.R. § 51.308(f)(2)(i).

In developing its plan, the state must document the technical basis for the SIP, including monitoring data, modeling, and emission information, including the baseline emission inventory upon which its strategies are based.[11] All of this information is part of a state's revised SIP and subject to public notice and comment. A state's reasonable progress analysis must consider the four factors identified in the Clean Air Act and regulations.[12]

EPA's 2017, Regional Haze Rule Amendments made clear that states are to first conduct the required Four-Factor Analysis for its sources, and then use the results from its Four-Factor Analyses and determinations to develop the reasonable progress goals.[13] Specifically, EPA explained in its final notice that it proposed, took and responded to comments and amended 40 C.F.R. § 51.308(f) to eliminate the cross-reference to 40 C.F.R. § 51.308(d) to "codify …[its] long-standing interpretation of the way in which the existing regulations were intended to operate" to track "the actual [SIP] planning sequence" as follows, thus, states are required to:

> (1) [C]alculate baseline, current and natural visibility conditions, progress to date and the URP;
> (2) [D]evelop a long-term strategy for addressing regional haze by evaluating the four factors to determine what emission limits and other measures are necessary to make reasonable progress;
> (3) [C]onduct regional-scale modeling of projected future emissions under the long-term strategies to establish RPGs and then compare those goals to the URP line; [FN73] and
> (4) [A]dopt a monitoring strategy and other measures to track future progress and ensure compliance.[14]

Moreover, in promulgating the RHR EPA stated that:

> The CAA requires states to determine what emission limitations, compliance schedules and other measures are necessary to make reasonable progress by considering the four factors. The CAA does not provide that states may then reject some control measures already determined to be reasonable if, in the aggregate, the controls are projected to result in too much or too little progress. Rather, the rate of progress that will be achieved by the emission reductions resulting from all reasonable control measures is, by definition, a reasonable rate of progress. … [I]f a state has reasonably selected a set of sources for analysis and has reasonably considered the four factors in determining what additional control measures are necessary to make reasonable progress, then the state's analytical obligations are complete if the resulting RPG for the most impaired days is below the URP line. *The URP is not a safe harbor*, however, and states may not subsequently reject control measures that they have already determined are reasonable.[15]

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[11] *Id.*

[12] *See* CAA 169A(g)(1); 40 C.F.R. 51.308(f)(2)(i).

[13] 82 Fed. Reg. at 3090-91.

[14] *Id.* at 3091.

[15] *See* 82 Fed. Reg. at 3093 (emphasis added).

Thus, the key determinant in whether a state's "robust determination" obligation has been satisfied under Section 51.308(f)(3)(ii)(B) is not whether the Reasonable Progress Goal ("RPG") of a Class I Area is below that Class I Area's URP, but rather whether a state has considered and determined requirements to make reasonable progress based on the four-factors. A state must consider the four-factors *regardless* of the status of any Class I Area's RPG.

The state's SIP revisions must meet certain procedural and consultation requirements.[16] The state must consult with the Federal Land Manager(s) and look to the Federal Land Managers' expertise of the lands and knowledge of the way pollution harms them to guide the state to ensure SIPs do what they must to help restore natural skies.[17] The RHR also requires that in "developing any implementation plan (or plan revision) or progress report, the State must include a description of how it addressed any comments provided by the Federal Land Managers."[18]

The duty to ensure reasonable progress requirements are met for purposes of the SIP rests with the state. While VISTAS plays an important role in providing support in regional haze planning, the state is ultimately accountable for preparing, adopting, and submitting a compliant SIP to EPA.

EPA's 2021 Clarification Memorandum

On July 9, 2021, EPA issued a memorandum titled, "Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period"[19] (the "July 2021 Memo"), providing important information regarding development of SIPs for all states for the regional haze second planning period in response to questions and information EPA has receiving from states and stakeholders. This Memo clarifies and provides information on existing statutory and regulatory requirements.

Particularly relevant here, EPA made clear that states must secure additional emission reductions that build on progress already achieved, with an expectation that reductions are additive to ongoing and upcoming reductions under other CAA programs.

This July 2021 Memo unequivocally states that meaningful reductions in SO2 and NOx pollution are expected to make reasonable progress towards the national goal of restoring visibility—reductions that are achievable looking across a full spectrum of options of emission reducing measures. States cannot avoid reductions based on an assertionthat visibility has improved, or due to implementation of another program, or because a source has some level of control.[20] Actual requirements for emission reductions are expected for a haze SIP to be approvable in the absence of rare circumstances, and EPA's recent Memo makes this abundantly

[16] For example, in addition to the RHR requirements, states must also follow the SIP processing requirements in 40 C.F.R. §§ 51.104, 51.102.

[17] 40 C.F.R. § 51.308(i).

[18] *Id.* § 51.308(i)(3).

[19] *Available at* https://www.epa.gov/system/files/documents/2021-07/clarifications-regarding-regional-haze-state-implementation-plans-for-the-second-implementation-period.pdf.

[20] *See* July 2021 Memo at 15.

clear. Similarly, the July 2021 Memo encourages states to consider equity and environmental justice when developing their plans.[21]

Substantive Comments

A. New Hampshire Cannot Rely On Prior Emisssion Limit Determinations at Merrimack Station to Meet Its Reasonable Further Progress Obligations

Both units at Granite Shore Power Merrimack Station ("Merrimack") are fully capable of achieving lower emission rates for NOx than DES assumes in its Draft Revision. Nonetheless, DES improperly proposes simply retaining prior (and inadequate) emission limits for Merrimack, despite the requirements to secure additional reductions in haze-causing pollutants as part of this SIP revision process.

At Merrimack, DES proposes simply retaining the 2019 NOx emission limits for the plant's two SCR-equipped coal-fired units: MK1 and MK2. *See* Draft Revision at 60. These limits impose a maximum NOx emission rate of 0.22 lbs/MMBtu on a 24-hour calendar day average for both units *unless* a "startup or shutdown" occurs on that day, in which case a dramatically less protective mass limit is imposed: 4.0 tons for MK1, and 11.5 tons for MK2.

DES characterizes these limits as "RACT," but these limits are far in excess of a proper NOx RACT standard (and indeed, are not that far off from the 0.25 lbs/MMBtu on a 24-hour calendar basis NOx limits for Schiller's coal-fired units, which DES *also* considers to be RACT, despite Schiller *not being equipped with SCR*).

RACT is a technology-forcing standard intended to ensure that polluting sources are controlled consistent with available methods for reducing pollution. Critically, "RACT is not designed to rubber-stamp existing control methods." *Sierra Club v. EPA*, 972 F.3d 290, 295 (3d Cir. 2020) (observing that RACT "is a technology-forcing mechanism."). As the Third Circuit has recently determined, "[w]hen originally introducing the standard, the EPA noted that 'the control agency, using the available guidance, should select the best available controls, deviating from those controls only where local conditions are such that they cannot be applied there and imposing even tougher controls where conditions allow.'" *Id.* (citing the Strelow Memo).[22]

As a result, RACT is a stringent standard, designed to induce and require improvements in control technology and reductions in pollutant emissions. Indeed, EPA has long maintained that "RACT should represent the toughest level of control considering technological and economic feasibility that can be applied to a specific situation" and that "[a]nything less than this is by definition less than RACT."[23]

[21] *Id.* at 16.
[22] Memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management, U.S. EPA, to Regional Administrators, Regions I - X (Dec. 9, 1976) (hereinafter "Strelow Memo"), *available at* https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/19761209_strelow_ract.pdf.
[23] Strelow Memo at 2.

RACT is defined as "the lowest emissions limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[24] The RACT definition comprises two parts: (a) technological feasibility and (b) economic feasibility.

(a) Technological Feasibility

"The technological feasibility of applying an emission reduction method to a particular source should consider the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements."[25]

(b) Economic Feasibility

As EPA has explained, "[e]conomic feasibility considers the cost of reducing emissions and the difference in costs between the particular source and other similar sources that have implemented emission reduction."[26] Specifically,

> EPA presumes that it is reasonable for similar sources to bear similar costs of emission reductions. **Economic feasibility rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources. Less efficient sources would be rewarded by having to bear lower emission reduction costs if affordability were given high consideration. Rather, economic feasibility for RACT purposes is largely determined by evidence that other sources in a source category have in fact applied the control technology in question.**[27]

Further, EPA has explained that RACT is not intended to enshrine existing control methods, but rather is technology-forcing.[28] Thus, "[i]n determining RACT for an individual source or group of sources, the control agency, using the available guidance, should select the best available controls, deviating from those controls only where local conditions are such that they cannot be applied there and imposing even tougher controls where conditions allow."[29]

Here, the proposed 0.22 lbs/MMbtu NOx limits for the two Merrimack units are inconsistent with both RACT and Regional Haze requirements. First, such limits appear to be

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[24] State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 55,620, 55,624/3 (Nov. 25, 1992); *see also Navistar Int'l Transp. Corp. v. United States EPA*, 941 F.2d 1339, 1343 (6th Cir. 1991) ("Since 1976, the EPA has interpreted reasonably available control technology to be the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.") (quotations omitted).

[25] U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental, 57 Fed. Reg. 18,070, 18,074 (Apr. 28, 1992).

[26] 57 Fed. Reg. at 18,074.

[27] 57 Fed. Reg. at 18,074 (emphasis added).

[28] Strelow Memo at 2.

[29] *Id.*

little more than improper rubberstamping of existing behavior at Merrimack. Figures 1 and 2 below look at the NOx emission rates for both Merrimack units on operating days reporting 24 hours' worth of operations (thereby excluding startup and shutdown periods). As can be seen, with the exception of some excursions at MK1, and even more excursions at MK2, both units seem to comfortably keep their 24-hour NOx emission rates at or below 0.20 lbs/MMbtu—roughly 10% below the limit. Indeed, MK2 keeps its daily NOx emission rate below 0.19 lbs/MMbtu half the time, and MK2 manages to keep its daily NOx emission rate below 0.185 lbs/MMbtu half the time.

Figure 1: Merrimack Unit MK1 Full Operating Day NOx Emissions[30]

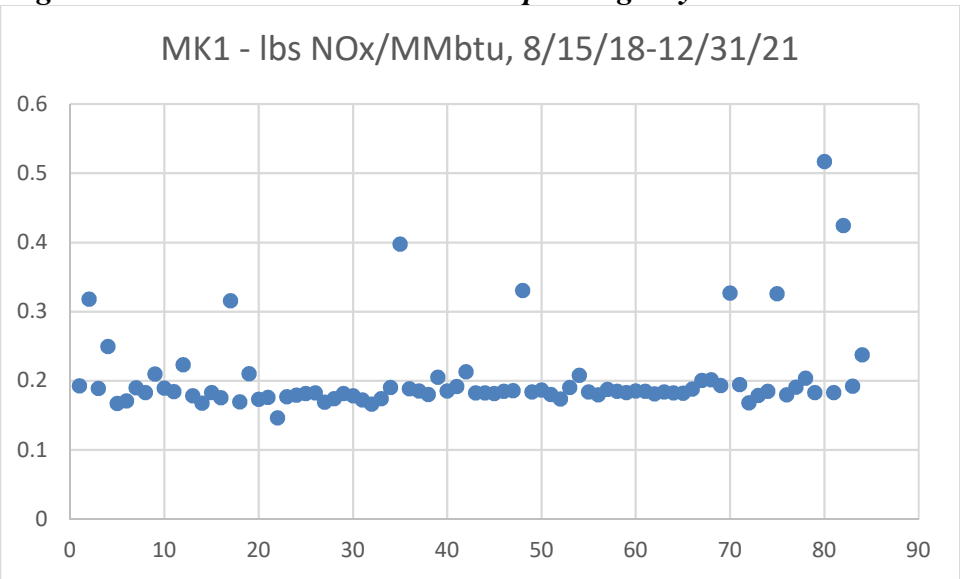
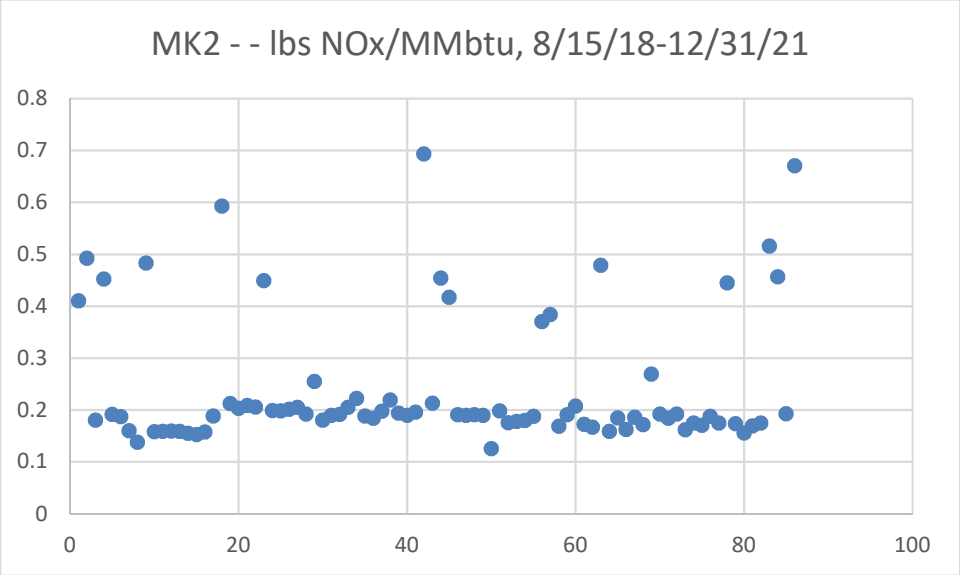


Figure 2: Merrimack Unit MK2 Full Operating Day NOx Emissions[31]



[30] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.
[31] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.

Accordingly, 0.22 lbs/MMbtu is inadequate as RACT, and for Regional Haze purposes.

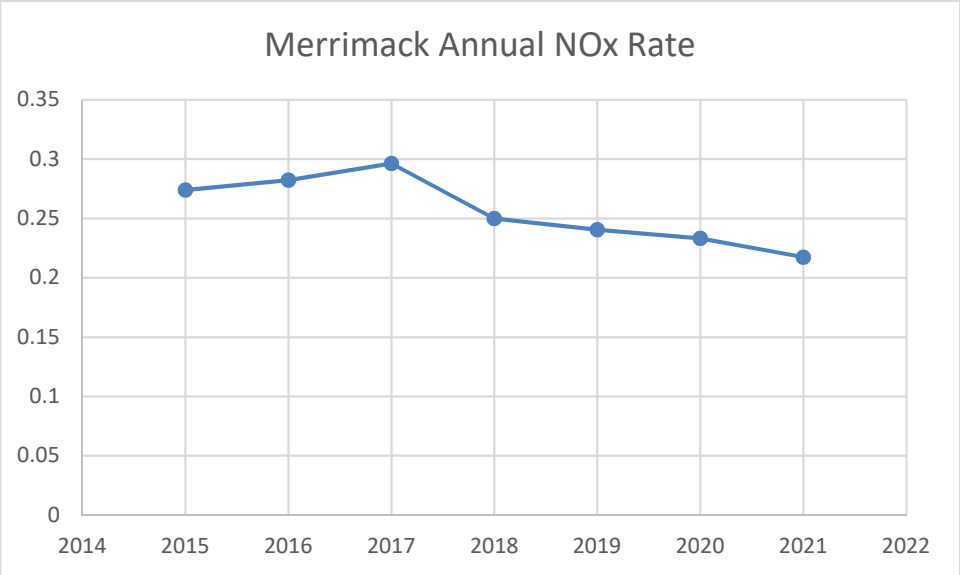
More than that, however, 0.22 lbs/MMbtu is completely out of step with what other states—and with what EPA—considers to be achievable by SCR-equipped units. Multiple other states in the Ozone Transport Commission (the "OTC," of which New Hampshire is a member) impose short-term NOx emission limits on their coal plants in keeping with RACT requirements. As detailed in the OTC's recommendation that EPA impose, under section 184(c) of the Clean Air Act, short-term NOx emission limits on Pennsylvania's coal fleet, Delaware, Maryland, and New Jersey all have regulations controlling NOx pollution from coal plants with short averaging periods. *See* 86 Fed. Reg. 4,049, 4053-54 (Jan. 15, 2021) (detailing Delaware's 0.125 lbs/MMbtu NOx emission limit on a 24-hour rolling basis for coal plants andMaryland's 0.10 lbs/MMbtu 24-hour block average limit "without any exceptions based on load levels or operating conditions,"). Not only do these regulations in nearby states demonstrate the technological and economic feasibility of such a short-term emission limit in New Hampshire, but they are significantly more protective of air quality than the extremely permissive 0.22 lbs/MMbtu NOx limits at Merrimack.

EPA's analysis in the context of the Cross State Air Pollution Rule likewise demonstrates that the proposed NOx limits at Merrimack are entirely out of step with what SCR-equipped coal units, such as those at Merrimack, are capable of achieving. In promulgating the 2021 Revised Cross State Air Pollution Rule Update, EPA determined that a NOx emission rate of 0.08 lbs/MMbtu was achievable by SCR-equipped units, even using a very conservative approach of focusing on the *third-best* ozone season performance of a coal unit:

> EPA updated the timeframe to include the most recent and best available operational data (i.e., 2009 through 2019). **Considering the emissions data over the full time period of available data results in a third-best rate of 0.08 pounds per million British thermal units** (lb/mmBtu), **EPA notes that over half of the SCR-controlled EGUs achieved a NOX emission rate of 0.068 lbs/mmBtu or less over their third-best entire ozone season**. Moreover, for the SCR-controlled coal units that EPA identified as having a 2019 emission rate greater than 0.08 lb/ mmBtu, EPA verified that in prior years, the majority (approximately 95 percent) of these same units had demonstrated and achieved a NOX emission rate of 0.08 lb/mmBtu or less on a seasonal and/or monthly basis. **This further supports EPA's determination that 0.08 lb/mmBtu reflects a reasonable emission rate for representing SCR optimization** . . .

86 Fed. Reg. 23,054, 23,088 (April 30, 2021) (emphasis added). By way of comparison, Merrmiack, on an annual, plantwide basis, comes in at emission rates of roughly *triple* what EPA presumes such SCR-equipped units should be able to achieve.

Figure 3: Merrimack Plantwide NOx Emission Rate, 2015-2021[32]



Indeed, as a comparison of Figures 1 and 2 on the one hand and Figure 3 on the other demonstrates, Merrimack's extraordinarily high NOx emission rates appear to have little to do with increased startup and shutdown cycling as its capacity factor has decreased over time;Merrimack appears to operate such that even when using its SCR controls, it comes in just under the limit that DES has imposed.

It is plain when looking at past operational data demonstrating that Merrimack's two units are in fact capable of achieving significantly lower NOx emission rates than they do presently:

Table 2: Historical Monthly Low NOx Emission Rates at Merrimack[33]

Facility Name	Unit ID	Month	Year	**Avg. NOx Rate (lb/MMBtu)**	NOx (tons)	Heat Input (MMBtu)
Merrimack	1	7	2001	**0.1025**	49.15	962,331
Merrimack	1	6	2001	**0.1134**	49.73	916,929
Merrimack	1	9	2002	**0.1136**	16.30	290,046
Merrimack	1	5	2002	**0.1196**	57.69	985,096
Merrimack	1	9	2001	**0.126**	47.77	812,182
Merrimack	1	7	2002	**0.1293**	55.17	972,914
Merrimack	1	5	2001	**0.1351**	56.24	894,224
Merrimack	1	8	2002	**0.1442**	51.90	844,872
Merrimack	1	6	2002	**0.1444**	59.30	918,895
Merrimack	1	9	2003	**0.1454**	64.31	884,447

[32] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.
[33] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.

Merrimack	1	8	2004	**0.1464**	68.91	942,012
Merrimack	2	6	2000	**0.1468**	154.80	2,260,073
Merrimack	2	3	2007	**0.1471**	184.50	2,516,901
Merrimack	2	7	2005	**0.1481**	183.53	2,478,920
Merrimack	1	6	2004	**0.1484**	63.36	855,322
Merrimack	2	8	2006	**0.1489**	189.78	2,571,196
Merrimack	2	9	2004	**0.149**	173.45	2,328,003
Merrimack	2	1	2007	**0.1493**	193.08	2,589,197
Merrimack	2	7	2006	**0.1501**	182.39	2,447,539
Merrimack	2	8	2004	**0.1506**	184.64	2,451,613
Merrimack	1	8	2006	**0.1507**	72.09	957,026
Merrimack	2	7	2000	**0.1507**	154.16	2,194,990
Merrimack	2	8	2003	**0.151**	177.02	2,433,076
Merrimack	2	6	2006	**0.1513**	169.44	2,261,309
Merrimack	2	7	2007	**0.1513**	193.49	2,568,221
Merrimack	1	9	2004	**0.1515**	63.52	847,186
Merrimack	1	5	2004	**0.1516**	56.42	774,207
Merrimack	1	7	2004	**0.1521**	66.70	896,742
Merrimack	2	1	2009	**0.153**	190.91	2,495,046
Merrimack	1	9	2005	**0.1538**	68.51	918,112
Merrimack	1	4	2007	**0.1541**	69.94	922,615
Merrimack	1	1	2007	**0.1545**	73.33	949,242
Merrimack	1	7	2006	**0.1549**	71.20	951,955
Merrimack	1	3	2009	**0.1554**	67.96	889,726
Merrimack	2	12	2008	**0.1558**	185.38	2,390,772
Merrimack	1	6	2003	**0.1559**	65.90	849,663
Merrimack	1	8	2001	**0.1561**	55.88	851,827
Merrimack	1	2	2009	**0.1564**	61.68	805,314
Merrimack	2	9	2006	**0.1566**	151.89	1,925,637
Merrimack	1	6	2005	**0.1573**	71.54	918,010
Merrimack	2	2	2007	**0.1576**	148.76	1,981,815
Merrimack	1	7	2005	**0.1577**	74.70	958,182
Merrimack	1	2	2007	**0.1584**	68.34	878,358
Merrimack	2	5	2005	**0.1596**	12.73	192,586
Merrimack	2	9	2001	**0.1599**	180.10	2,266,748

DES does not point to any reason why Merrimack cannot now achieve lower NOx emission rates like it did throughout the early and mid-2000s, under varying load conditions.

Merrimack's inadequate NOx control appears even more stark when compared to Granite Shore Power Schiller Station ("Schiller"). Schiller *lacks* SCR, and is equipped with SNCR only—a much less effective control. Draft Revision at 61. Nonetheless, for the past several

years, Schiller's two coal units combined have achieved a *better* annual NOx emission rate than Merrimack has.

Figure 4: Schiller Coal Unit NOx Emission Rate, 2015-2022[34]

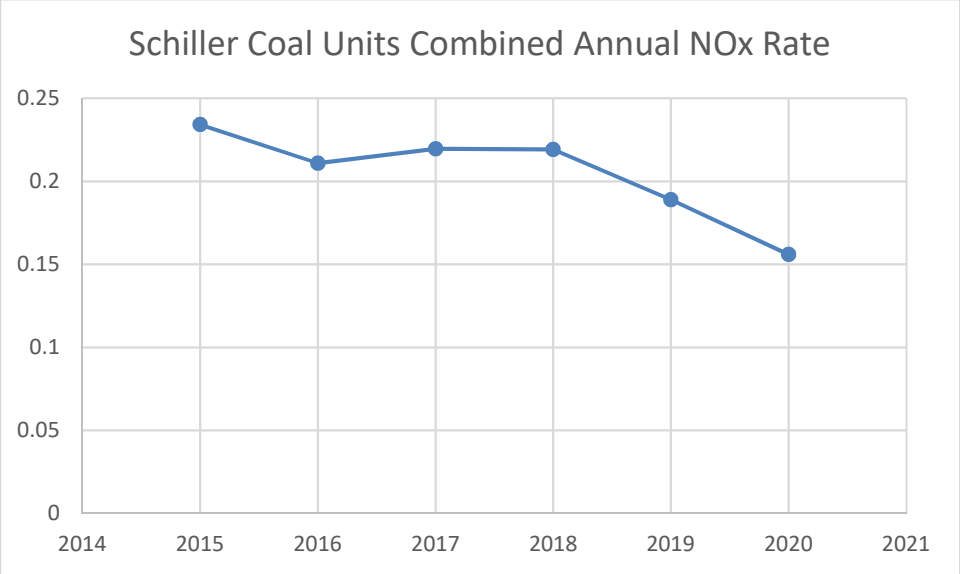


Table 2: Merrimack and Schiller Plantwide Coal Annual NOx Emission Rates[35]

Year	Schiller	Merrimack
2015	0.2341668	0.27383277
2016	0.2109529	0.28239461
2017	0.2195951	0.29635324
2018	0.2191149	0.2500424
2019	0.1890279	0.24039448
2020	0.1558938	0.23315201
2021		0.21744514

There is plainly considerable control slack available at Merrimack, and DES should require Merrimack to make use of it.

Nor is it necessary that DES allow Merrimack to emit greater quantities of NOx at higher emission rates on the days in which a unit undergoes startup or shutdown. Notwithstanding the theory that lowered control inlet temperatures during startup and shutdown necessitate bypassing the SCR, recent information shows that SCR controls can in fact be operated at low-temperature levels with no detriment to control efficacy or longevity.

[34] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/. No data is available for 2021, as Schiller did not operate in 2021.
[35] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/. No data is available for Schiller in 2021, as Schiller did not operate in 2021.

As AECOM has reported, for example, sodium-based solution or "SBS" injection can control SO3 levels in flue gas such that ammonium bisulfate deposition can be greatly reduced in SCR systems. This means that ammonia injection can be elevated to achieve higher NOx removal rates without ill effect, and catalyst maintenance and replacement costs can be reduced. Since the low temperature loophole is premised on the avoidance of bisulfate deposition, this form of injection system could at low cost remove any purported "need" for the loophole. *See* AECOM "SBS Injection for Enhanced SCR/SNCR Performance."[36]

Likewise, Duke Energy presented on the use of sorbent injection systems as a method for enhancing SCR control performance at the Worldwide Pollution Control Association Coal & Gas Seminar on August 24, 2016. There, Duke observed that SCR can be operated at low loads if sorbent injection systems are employed to remove SO3 in the flue system prior to gases reaching the SCR, which "can greatly reduce" the minimum operating temperature ("MOT") of the control. *See* Duke Energy "Sorbent Injection for Low Load Operating Flexibility," (Aug. 30, 2016) at 9.[37] Indeed, issues with catalyst fouling can be managed with sorbent injection by allowing higher ammonia slippage with the SCR, which can ensure that any low temperature depositions on the catalyst can be removed during higher temperature operations. *Id.*

Accordingly, DES must, consistent with both RACT and Regional Haze requirements under the Clean Air Act, impose a significantly lower set of NOx emission limits at Merrimack.

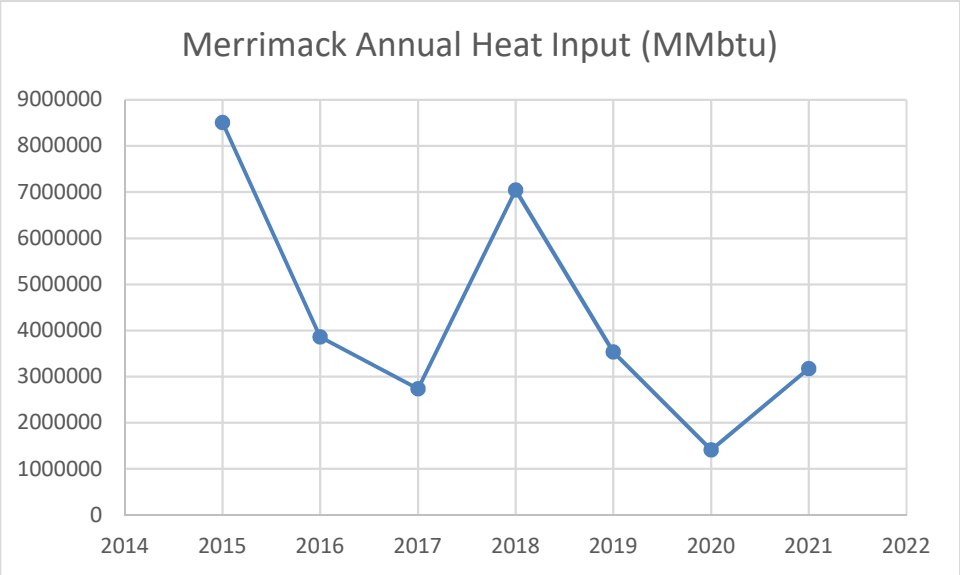
B. New Hampshire Must Incorporate Recent Low Capacity Factors at Merrimack and Schiller into Its Haze SIP

While DES properly does not rely on unenforceable reductions in pollution from Granite Shore Power's two coal-fired power plants—Merrimack and Schiller—to achieve its Reasonable Further Progress obligations, the Haze SIP must incorporate recent decreased capacity factors at these two facilities to bar against future operations increases jeopardizing Further Progress.

Both Merrimack and Schiller have experienced decreased operations relative to 2015 in recent years. From 2015 to 2020, as measured by heat input, Merrimack's operations have declined over 80%.

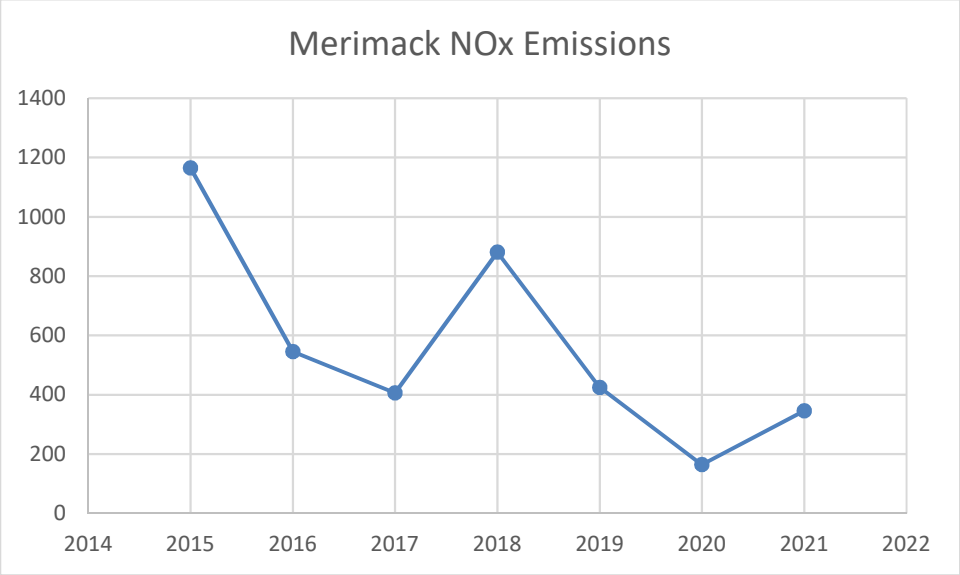
[36] *Available at* https://www.aecomprocesstechnologies.com/wp-content/uploads/2016/08/AECOM-Process-Technologies-SBS-Injection-for-Enhanced-SCR-Performance.pdf.
[37] *Available at* http://wpca.info/pdf/presentations/Gallatin2016/9-Sorbent%20Injection%20for%20Low%20Load%20Operating%20Flexibility%20by%20Chad%20Donner,%20Duke.pdf)

Figure 5: Merrimack Annual Operations, 2015-2021[38]



However, there is no guarantee that 2020 (an aberrant year because of the COVID-19 pandemic) represents a permanent new normal at Merrimack; Merrimack's operations appear to swing wildly, with heat input more than doubling from 2017 to 2018, and more than doubling again from 2020 to 2021. Unsuprisingly (given Merrimack's lackluster NOx control operation), Merrimack's total NOx emissions have matched this operational profile:

Figure 6: Merrimack Annual NOx Emissions in Tons, 2015-2021[39]



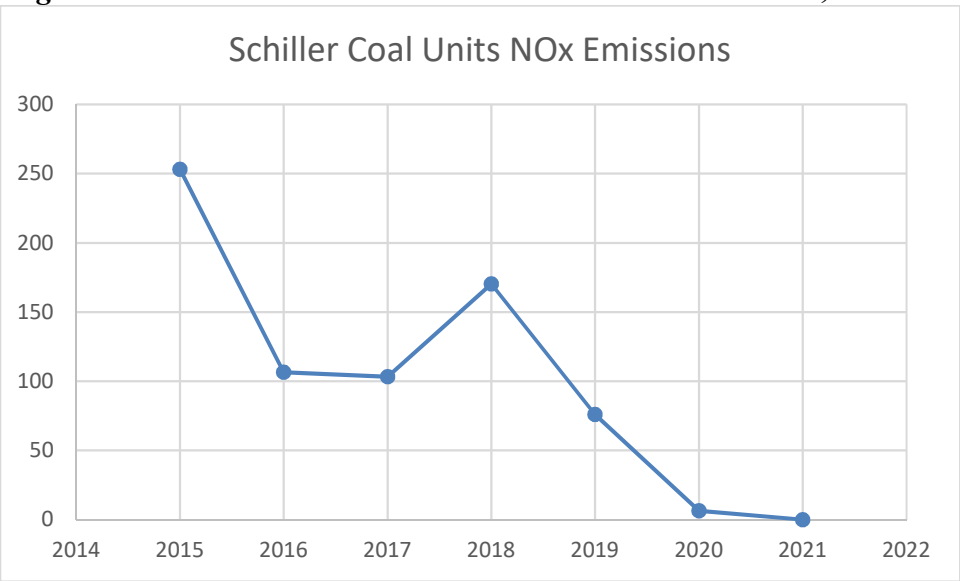
Accordingly, while total NOx emissions may be down for the moment from Merrimack, nothing prevents them from rebounding to higher previous levels—Merrimack could continue to comply with the very generous 0.22 lbs/MMbtu NOx emission rate that DES proposes while

[38] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.
[39] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.

dramatically increasing overall NOx emissions if Merrimack simply returned to pre-pandemic levels of operation.

The situation at Schiller is similar. While during the pandemic years of 2020 and 2021, Schiller's coal units emitted very little NOx, it was averaging well over 100 tons per year just before that.

Figure 7: Schiller Coal Units Annual NOx Emissions in Tons, 2015-2021[40]



Absent any requirement to curtail operations, Schiller could quickly return to this high-NOx emitting status whenever its operators decide to increase operations again. As DES recognizes:

> **The most impactful of New Hampshire's sources are the fossil-fuel-fired EGUs**. While recent developments in the oil and gas industry have forced rapid changes in the power production sector, and some generating units have experienced sharp reductions in utilization, **no retirements or replacements of New Hampshire's EGUs have occurred or been announced since the regional haze SIP was first submitted in 2010**. While Granite Shore Power announced an extended outage at Schiller Station in June of 2020 with no end date, **no official word from the company regarding a permanent shut down has been announced by the owners**.

Draft Revision at 53 (emphasis added). Visibility in nearby Class I areas, and air quality in New Hampshire in general, has benefited from decreased operations at Merrimack and Schiller; the Haze SIP should incorporate these reduce operations through capacity factor limitations to ensure that visibility continues to improve.

[40] Data taken from U.S. EPA, Air Markets Program Data, *available at* https://ampd.epa.gov/ampd/.

C. DES Must Consider Climate Change and Environmental Justice In Order to Comply with Executive Orders

There are additional legal grounds for considering environmental justice when determining Reasonable Progress controls. Under the CAA, states are permitted to include in a SIP measures that are authorized by state law but go beyond the minimum requirements of federal law.[41] Ultimately, EPA will review the haze plan that New Hampshire submits, and EPA will be required to ensure that its action on this Haze Plan addresses any disproportionate environmental impacts of the pollution that contributes to haze. Executive Orders in place since 1994 require federal executive agencies such as EPA to:

> [M]ake achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations"[42]

Further, on January 27, 2021, the current Administration signed the "Executive Order on Tackling the Climate Crisis at Home and Abroad."[43] The new Executive Order on climate change and environmental justice amended the 1994 Order and provides that:

> It is the policy of [this] Administration to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; … protects public health … delivers environmental justice … Successfully meeting these challenges will require the Federal Government to pursue such a coordinated approach from planning to implementation, coupled with substantive engagement by stakeholders, including State, local, and Tribal governments.[44]

New Hampshire can and should facilitate EPA's compliance with these Executive Orders by considering climate change impacts and environmental justice in its SIP submission. Indeed, climate change is already threatening New Hampshire's Class I areas: New Hampshire's highest peak, Mount Washington, which is adjacent the Great Gulf and Presidential Range Dry River Wilderness areas, has a 84-year record showing climate warming and changing seasonal

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[41] *See Union Elec. Co v. EPA*, 427 U.S. 246, 265 (1976) ("States may submit implementation plans more stringent than federal law requires and . . . the Administrator must approve such plans if they meet the minimum requirements of s 110(a)(2)."); *Ariz. Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1126 (10th Cir. 2009) (quoting *Union Elec. Co.*, 427 U.S. at 265) ("In sum, the key criterion in determining the adequacy of any plan is attainment and maintenance of the national air standards . . . 'States may submit implementation plans more stringent than federal law requires and [ ] the [EPA] must approve such plans if they meet the minimum [Clean Air Act] requirements of § 110(a)(2).'"); *BCCA Appeal Group v. EPA*, 355 F.3d 817, 826 n. 6 (5th Cir. 2003) ("Because the states can adopt more stringent air pollution control measures than federal law requires, the EPA is empowered to disapprove state plans only when they fall below the level of stringency required by federal law.")

[42] Exec. Order No. 12898, § 1-101, 59 Fed. Reg. 7629 (Feb. 16, 1994), as amended by Exec. Order No. 12948, 60 Fed. Reg. 6381 (Feb. 1, 1995).

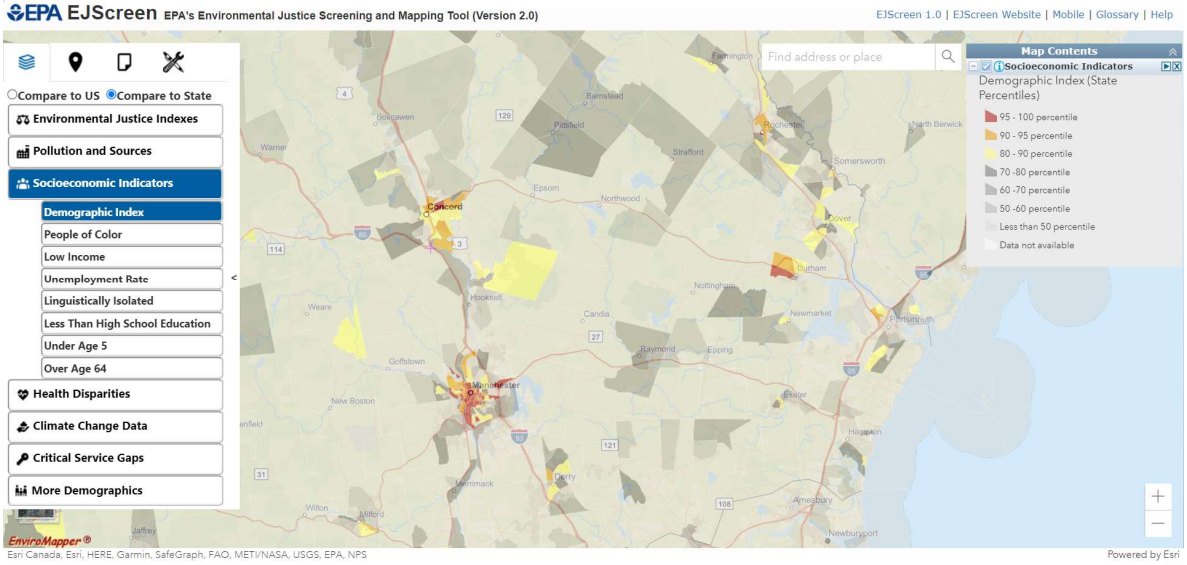
[43] Exec. Order No. 14008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

[44] *Id.* at § 201.

conditions.[45] Climate change impacts in the Northeastern US include increases in the frequency of extreme weather events, such as intense rainfall, and earlier snowmelt. These processes have been implicated in increasing nutrient transport (e.g., dissolved organic carbon) from terrestrial watershed components such as soils to freshwaters, including in sensitive mountain ponds, potentially influencing freshwater foodwebs.[46]

In addition, DES should take note of the fact that the communities near the Merrimack and Schiller facilities have higher percentages of low-income residents and people of color than New Hampshire as a whole, as demonstrated by EPA's EJScreen tool's analysis of the area's Demographic Index.

Figure 8: EJScreen Analysis of New Hampshire Demographic Index[47]



Accordingly, securing further reductions in air pollution from Merrimack and Schiller, or ensuring that pollution levels do not increase with potential increased future operations, would not only help New Hampshire achieve its Regional Haze requirements, but also advance equity in the state.

Conclusion

As explained above, DES must improve emission limits at major sources of haze-causing pollution, such as and including Merrimack and Schiller, in order to ensure that its Draft Revision complies with the Clean Air Act. In particular, DES should impose NOx emission limits consistent with RACT and significantly lower than the limits currently in place at

[45] *See* Murray et al., "Climate Trends on the Highest Peak of the Northeast: Mount Washington, NH," *Northeastern Naturalist* 28(Special Issue 11):64-82 (2021), *available at* https://www.eaglehill.us/NENAonline/articles/NENA-sp-11/14-Murray.shtml, and attached hereto as Exhibit 1.

[46] *See* Nelson et al., "Northeastern mountain ponds as sentinels of change: Current and emerging research and monitoring in the context of shifting chemistry and climate interactions," *Atmospheric Environment* 264 (Nov. 2021), *available at* https://doi.org/10.1016/j.atmosenv.2021.118694.

[47] Data taken from U.S. EPA, EJScreen: Environmental Justice Screening and Mapping Tool, *available at* https://www.epa.gov/ejscreen. *See also* Exhibit 2, with data taken from the same source.

Merrimack, should impose capacity factor restrictions reflective of current low-level operations at the state's coal-fired generating units, and should incorporate efforts to address climate change, disparate impacts, and other environmental justice concerns into the Proposal it submits to EPA.

Sincerely,

/s/

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New Hampshire Regional Haze Plan Periodic Comprehensive Revision
COMPILATION OF PUBLIC COMMENTS AND NEW HAMPSHIRE'S RESPONSES THERETO (2018-2019)

Comments were received from:

- *EPA submitted comments in a letter dated May 7, 2019.*
- *FLMs submitted comments in a letter dated October 22, 2018.*
- *The North Carolina Division of Air Quality (NCDAQ) submitted comments in a letter dated December 20, 2019.*
- *The Virginia Department of Environmental Quality (VADEQ) submitted comments in a letter dated December 20, 2019.*
- *The West Virginia Department of Environmental Protection, Division of Air Quality (WVDAQ) provided comments in a letter dated December 18, 2019.*
- *The Sierra Club (SC) and National Parks Conservation Association (NPCA) provided comments in a letter dated December 30, 2019.*

These comments will be addressed in four sections below. The full text of all comments received can be found in Appendix W.

1. EPA Comments

EPA provided an annotated copy of the SIP with many specific questions and notes that have been addressed in subsequent revisions. In addition, EPA made the following comments in a letter dated May 7, 2019:

EPA Comment 1: " ... the reasonable progress goals should be based solely on federally enforceable provisions of the long-term strategy..."

NHDES Response: Sections 4.2.8 and 4.2.9 of the SIP submittal includes a detailed description of federally enforceable control measures and site-specific limitations that contribute to achieving reasonable progress goals.

EPA Comment 2: NHDES should revise the baseline visibility for NH Class I areas using 5 complete years of monitoring data closest in time to 2000-2004.

NHDES Response: After the comment was received, NHDES made this revision as requested, however, subsequent guidance[1] from EPA specified the that data from Great Gulf was to be calculated with the four valid years during the 2000-2004 period. The updated SIP follows this guidance and the calculations included in it.

EPA Comment 3: NH should be consistent with use of worst/most impaired visibility days and cleanest/clearest visibility days.

NHDES Response: This has been addressed by using the terms "most impaired" and "clearest" days throughout the plan.

[1] EPA, (June 2020). Memo from EPA to Regional Air Division Directors. *Recommendation for the Use of Patched and Substituted Data and Clarification of Data Completeness for Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program.* Available at: https://www.epa.gov/sites/default/files/2020-06/documents/memo_data_for_regional_haze_0.pdf)

EPA Comment 4: The SIP should reflect NH's independent methods and conclusions to address regional haze in Class I areas, not just the work of MANE-VU.

NHDES Response: Additional details have been added to the report to explain state specific evaluation and methods to address regional haze.

EPA Comment 5: NH's fuel sulfur limits need to be a part of the SIP to be federally enforceable and therefore, a legitimate component of the of the long-term strategy.

NHDES Response: NH's fuel sulfur limits rules Env-A 1600, *Fuel Specifications*, were submitted to EPA for incorporation into the SIP on May 17, 2019. Final approval was issued by EPA on April 26, 2021. This is noted in Section 4.2.8 of the plan.

EPA Comment 6: NH should clarify if components of long-term strategy for the next planning period, including whether current controls are sufficient.

NHDES Response: Detail has been added to Section 4.2.9 of the SIP to explain components of the long-term strategy and review of whether current controls in place are sufficient to achieve progress.

EPA Comment 7: Please address the National Park Service request to evaluate sources potentially impacting Acadia National Park.

NHDES Response: NHDES conducted additional modeling analyses on two sources (Burgess BioPower and Wheelabrator Concord) to address the National Park Service request. Refer to discussion in Section 2.2 of the plan.

EPA Comment 8: Please consider emission reductions due to ongoing air pollution control programs, measures to mitigate the impact of construction activities, source retirement and replacement schedules and basic smoke management practices for prescribed fires as a part of the long-term strategy and as required by 40 CFR Part 51.308(f)(2(iv).

NHDES Response: Section 4.2.8 was added to the plan to address these additional factors in the long-term strategy.

2. FLM Comments

FLM comments centered around the selection and evaluation of specific sources potentially impacting visibility in Class I areas. Over the last several years, NHDES has responded to FLM feedback and as a result, expanded the number of sources evaluated in order to ensure a robust analysis and adequate controls are implemented to improve visibility.

3. State Comments

Common themes from the State comments include:

- *Inclusion of Ask measures in LTS/RPG,*
- *Contribution assessment,*
- *Timeline, and*
- *Other comments*

Before addressing specific comments provided by other states, we offer the following background on the approach used by NHDES in determining states to include for consultation and what is hoped for in response to the MANE-VU Ask.

A. NHDES and MANE-VU used multiple screening tools to help identify states that have emissions sources that have the potential to cause visibility impact at New Hampshire and other MANE-VU federally designated Class I areas. These states were then included in the MANE-VU consultation list and presented with an "Ask" of measures to consider including in their SIPs. Since weather patterns vary every year and different metrics can be used to set thresholds, there is no single method that precisely determines which states significantly contribute and to what degree. MANE-VU decided to utilize a screening method for identifying states with the potential to contribute based on recent actual emissions. This differs from methods being suggested by commenting states.
B. States selected for consultation were presented with an Ask and given an opportunity to better understand the methodologies and approaches used by MANE-VU in creating the Ask. Some states used this as an opportunity to let MANE-VU know of any data errors, recent power plant shut downs, and other permanent changes in emissions.
C. The Ask does not tell states they must adopt anything, but instead asks them to review emissions-reducing measures identified by MANE-VU states as being reasonable for many of their own emission sources. This is intended to be a starting point in the technical analysis for upwind state's SIPs. Based on the state's own analysis, they will either determine that some or all of the Ask measures are reasonable and adopt them, or they won't. NHDES is not telling any state what they must adopt in their SIPs, but is rather asking them to analyze these measures.
D. NHDES includes emissions reductions identified in the Ask as part of New Hampshire's long term strategy and reasonable progress goals because we believe they are reasonable and hope other states will as well. Modeling results for the baseline condition are also presented in the event that measures are not adopted. Fortunately, the measures requested in the MANE-VU Ask are not needed for New Hampshire to meet rate of progress visibility requirements, but since the regional haze rule preamble and subsequent EPA guidance specify that additional reasonable measures must be evaluated and adopted by states, even if rate of progress requirements are being met, there should be at least some additional visibility improvement beyond baseline.

Inclusion of Ask measures in LTS/RPG

All three commenting states raised concerns that NHDES included measures from the Ask in the state's reasonable progress goals. The MANE-VU states debated this matter and NHDES determined that attempting to include only agreed-upon measures for other states in modeling creates an impossible goal. Many states have lengthy legislative processes that may take years to formally adopt measures into rule, in some cases years after SIP due dates. To perform final modeling only after each upwind state has agreed to every emission change in the modeling is simply idealistic. The timetable in such a scenario would be controlled by the last state to act, and even then, it would not be clear if the measures being pursued by that state are approvable. Based on the experience of the 2008 regional haze SIPs, obtaining state commitment and emission guarantees may even run a year or two beyond the SIP deadline. Below are some quotes extracted from the comment letters that emphasize this very point:

> NCDAQ; "*The DAQ has not agreed with NH or any other MANE-VU state to include any control measures, including those included in the Inter-RPO Ask*."
>
> VADEQ; "*The emission control measures listed in the MANE-VU Ask are currently not federally enforceable in Virginia. At this time, whether or not these control measures or other control measures will be included in Virginia's SIP is unclear since DEQ has not finalized its screening methodology or notified facilities of the need to submit a four-factor analysis."*

WVDAQ; "*The WVDAQ must first draft and then the West Virginia Legislature must approve a rule prior to inclusion in a SIP. Final determinations of SIP completeness rests with the USEPA*."

MANE-VU "Ask"

Since MANE-VU modeling for both the baseline case and the inclusion of Ask measures case both demonstrate that rate of progress goals will be met, it is not critical to know exactly what each state is going to agree to in their SIPs in order to present the modeling results. NHDES determined the measures that New Hampshire will commit to and included them in the state's Long Term Strategy plan. The reasonable progress goal is met based on both modeling scenarios, which act more as a goal range than a specific must-meet goal number.

NCDAQ Comment: New Hampshire has identified NC as a state reasonably anticipated to contribute to visibility impairment at the GGPRDR Wilderness Areas. The DAQ has not agreed with NH or any other MANE-VU state to include any control measures, including those included in the Inter-RPO Ask. Therefore, the DAQ requests that NH revise its LTS/RPG for the GGPRDR Wilderness Areas to exclude the control measures identified in the Inter-RPO Ask and NH's proposed regional haze SIP.

NHDES Response: Under the MANE-VU Ask, the MANE-VU states requested that states identified as contributing to visibility impairment at a federally designated MANE-VU Class I area perform analyses on select emissions sources to see if additional measures are reasonable for application. MANE-VU identified that similar measures within our region are typically reasonable and something member states agreed to pursue in their SIPs. NHDES did not ask that NC, or any other state, include any control measures that they determine are not reasonable, but rather analyze and pursue measures that are found to be reasonable. Further, CMAQ 2028 modeling results are presented in the New Hampshire SIP for on the books-on the way measures (baseline case) and for an estimated full application of the MANE-VU Ask. Both scenarios meet rate of progress goals, but since MANE-VU feels the measures suggested in the Ask are reasonable and should be evaluated and pursued, they are included in the RPG. The regional haze rule preamble and subsequent EPA guidance require states to evaluate additional emission reducing measures even if rate of progress goals are predicted to be met.

VADEQ Comment: If the RPG for Class I areas includes Virginia emissions reductions derived from the MANE-VU Ask as described in Section 4.2.4, the RPG should be recalculated omitting such reductions. The emission control measures listed in the MANE-VU Ask are currently not federally enforceable in Virginia. At this time, whether or not these control measures or other control measures will be included in Virginia's SIP is unclear since DEQ has not finalized its screening methodology or notified facilities of the need to submit a four-factor analysis.

NHDES Response: VADEQ's position is understandable. MANE-VU realizes that VADEQ has not yet had the chance to determine what is reasonable for the state to pursue. The MANE-VU Ask requests that the suggested measures and actions be evaluated and pursued based on what is reasonable. NHDES presents modeling results with and without the addition of the MANE-VU Ask and both meet rate of progress requirements. Since the regional haze rule requires that states consider if additional measures might be reasonable, and MANE-VU identified these measures as being reasonable in most cases in our region, we still consider them to be reasonable progress goals.

WVDAQ Comment: WVDAQ does not have the authority to make unauthorized commitments within SIPs, and West Virginia or any other jurisdiction has no obligation to comply with the Inter-RPO Asks within the proposed SIP.

NHDES Response: NHDES recognizes that states have their own requirements and processes for SIP development. However, the regional haze rule requires that certain evaluations be conducted and that consultation be completed. MANE-VU requested that WV participate in consultations and address the Ask in their SIP development. MANE-VU or NHDES are not "requiring" that WVDAQ take any regulatory action. Instead, we have identified emission sources that we believe should be analyzed for reasonableness of emissions measures, and we identified measures that we felt were reasonable enough for us to pursue. Because of this, we "Asked" WVDAQ to analyze them as well. What WVDAQ includes in an approvable regional haze SIP is up to WVDAQ, EPA, and the FLMs, but addressing the MANE-VU Ask is required under sections 51.308(d)(1)(iv) and 51.308(f)(2)(ii)(C) of the regional haze rule.

Contribution Assessment

NHDES is grateful that commenting states have shared results from the CAMx modeling effort conducted by VISTAS. NHDES does not dispute the data presented other than to say that the metrics being discussed are not the same. Values presented from VISTAS modeling represent the average of state contribution over the 20% most impaired days using 2028 emissions and one year (2011) of meteorology. MANE-VU's chosen metric was the maximum 24-hour potential contribution based on actual 95th percentile 2015 emissions over three years of meteorological data. MANE-VU's calculated contribution metric is simply going to be higher based on form and emissions year, but values were still used in a relative sense by considering percent potential contribution. During consultation, some states raised concerns that the MANE-VU modeling didn't account for planned retirements and other expected emission reductions, and it is MANE-VU's position that these can be accounted for and credited toward meeting the "Ask" by ensuring that such actions are federally enforceable and included in State SIPs.

Because the metric used differs from that being considered by VISTAS, there is a resulting difference in opinion regarding which states should be included in consultation with NHDES:

NCDAQ Comment: Modeling undertaken by the Visibility Improvement – State and Tribal Association of the Southeast (VISTAS) using the Comprehensive Air Quality Model with Extensions (CAMx) photochemical grid model, though preliminary, does not support the conclusion that NC is a contributor to visibility to the GGPRDR Wilderness Areas. Further, this methodology is superior to the techniques like Q/d and CALPUFF used by MANE-VU. Lastly, state contributions to visibility impairment in Class I areas should be calculated for 2028, not 2015. The DAQ requests that NC be removed from NH's list of states considered to be reasonably attributing to visibility impairment at the GGPRDR Wilderness areas.

NHDES Response: NHDES agrees with NCDAQ that regional models such as CAMx are a useful tool for analyses such as this, however when MANE-VU conducted their contribution analysis the technique for assessing haze contribution with CAMx was just under development, as we were informed under early consultation with FLMs. MANE-VU conducted a screening-level, yet still robust, contribution assessment based on the weight of evidence provided by several established analysis techniques. Therefore, NHDES feels that it is appropriate to retain NC as a state considered to be reasonably attributing to visibility impairment at New Hampshire's Class I areas.

VADEQ Comment: Virginia DEQ does not believe that screening methodologies for the evaluation of reasonable progress should be based on 2011 emissions and 2015 CAMD EGU emissions. Rather, 2028 emission projections should be used for such evaluations to ensure that the latest information concerning plant closures, controls, fuel switches and other impacts are considered in the screening process.

NHDES Response: The VADEQ preference for using emissions projected to 2028 is logical; MANE-VU states discussed using 2028 as well as other years. It was decided that it made more sense for MANE-VU to use reported emissions from a recent year rather than to assume that emissions projected more than ten years into the future (at the time of the decision) would be accurate. Much of the emission reduction during recent years took place because of economic factors that are not locked in for 2028. Thus including these reductions in the starting point distorts results if the economics change prior to 2028. MANE-VU understands that facility fuel switches and shutdowns have, and will, occur since the MANE-VU analysis 2015 base year and prefer that this information be applied towards meeting the MANE-VU Ask.

VADEQ Comment: Virginia supports the VISTAS approach of using PSAT in CAMx as opposed to CALPUFF because CAMx is considered to have more robust chemistry.

NHDES Response: NHDES agrees with VADEQ that CAMx has more robust chemistry than the Q/d and CALPUFF analyses conducted by MANE-VU, but as discussed above, MANE-VU's contribution assessment was a screening-level, yet still robust, analysis based on several established techniques. Being a state with two federally designated Class I areas, NHDES also prefers that more than one year of meteorology be considered before concluding if a state potentially contributes to visibility impairment or not. CAMx is typically run with one year of meteorology while the MANE-VU CALPUFF study used three years.

WVDAQ Comment: WVDAQ contends the modeling used by MANE-VU, estimated emissions from upwind sources divided by the distance to the area (Q/d), the utilization of the California Puff Model (CALPUFF) Long Range Transport (LRT) model to calculate impacts from upwind sources, are not the most technically valid for such estimations. A more accurate estimation would utilize projected 2028 emissions, and sources in West Virginia are well beyond the recommended transport distance for using CALPUFF. Further, HYSPLIT fails to incorporate chemical reactions and depositions between the emission point and the receptor site.

NHDES Response: MANE-VU discussed options for performing contribution assessments early in the 2018/21 SIP process and decided to use Q/d and CALPUFF as screening tools as was done during the previous regional haze SIP implementation period. During early consultation, both the FLMs and EPA expressed concern about the use of CALPUFF and MANE-VU agreed to use the model only as a screening tool to identify emission sources that would potentially benefit from further analysis. As such, it was not used for regulatory purposes and its use was limited to determining the relative percentage of the impact associated with each source. WVDAQ is correct in that HYSPLIT does not include chemistry or deposition algorithms. Nevertheless, it is a useful tool for evaluating the movement of air parcels and any associated air pollution. Therefore, MANE-VU used it, along with Q/d and CALPUFF, as part of a weight of evidence screening analysis to evaluate states and sources for potential contribution to MANE-VU's Class I areas.

WVDAQ Comment: Preliminary runs completed by Visibility Improvement – State and Tribal Association of the Southeast (VISTAS) using Particulate Matter Source Apportionment (PSAT) project total statewide emissions to 2028 that are much lower than those modeled by MANE-VU. West Virginia as well as the other VISTAS members should be completely excluded from the proposed SIP.

NHDES Response: NHDES appreciates that recent modeling conducted by VISTAS with the CAMx PSAT tool is now available and shows lower contributions for many states than estimated by MANE-VU. The biggest factor for this difference is that VISTAS modeling used projected 2028 emissions while MANE-VU used 2015 emissions. Another factor is that VISTAS modeling considers the one-year average of 20% most impaired days versus the MANE-VU three-year 24-hour maximum contribution. MANE-VU realizes that CALPUFF may predict more contribution than predicted by other models, but it used in a relative sense

and was only one of several tools used as part of a weight of evidence analysis to determine which emissions sources may warrant further consideration for controls. Therefore, NHDES feels that it is appropriate to retain WV and other applicable VISTAS states on the list of states that potentially contribute to visibility impairment at MANE-VU's Class I areas.

Timeline

Comments were received suggesting that since EPA delayed the regional haze SIP submittal date from 2018 to 2021 that New Hampshire and other MANE-VU states should wait until then to submit SIPs so that more assurance can be provided in terms of emissions from states in other regions. This suggestion is not without its merits, but it also has costs and resource demands and it will not improve the New Hampshire SIP in any meaningful way since NHDES has already determined emissions measures to be taken by the state. Acknowledging that delayed modeling results may have some extra assurance of future year emissions, such results should still be within the range of modeling results already being presented in the New Hampshire SIP. Also, asking states with SIPs nearly ready for submittal to delay for three years would require them to update monitoring and emissions information tabulated in the SIP, extend consultation to an uncertain date, re-perform contribution analyses, and perform another CMAQ model run to establish RPGs.

MANE-VU decided to continue to pursue SIP submittals closer to the 2018 due date because, at the time, MANE-VU had already conducted much of the monitoring and emissions background work believing that 2018 would be the due date. While waiting until 2021 allows more time to complete the work, it comes with the extra workload of updating much of the work already completed and a risk that the 2011 modeling platform would no longer be acceptable to EPA for the SIPs. It simply did not make sense then, and still does not make sense, for MANE-VU to update the extensive data analyses already completed when the modeling results would not likely be significantly changed.

Other Comments

NCDAQ Comment: KapStone's visibility impacts appear to be too high compared to nearby facilities with higher emissions. This point was discussed with NHDES in January of 2018 and a mistake was found. The unit should not be included under Ask #2.

NHDES Response: NCDAQ is correct that there was a copy error in a spreadsheet that was not caught prior to issuing the Ask during consultation. We thank NCDAQ for bringing this issue to our attention and should find that the Ask included in the NHDES draft SIP reflects this correction.

VADEQ Comment: Yorktown units #1 and #2 have been retired and #3 is an old unit that operates on an annual capacity factor 8% averaged over 24-months. Unit #3 SO_2 emissions were 399, 909, 2070, 635, 269, and 821 tons per year for the years of 2013, 2014, 2015, 2016, 2017, and 2018 respectively. ERTAC estimates Unite #3 2028 SO_2 emissions to be 368 tons, but the owner indicates that the unit could shut down in 2022.

NHDES Response: Thank you for sharing this information. It is helpful to understand that the Unit #3 emissions were significantly higher in 2015 than in other recent years and that it may face shut down before 2028. Units permanently shut down do not need to perform any additional analysis to fulfil the MANE-VU Ask. Should Unit #3 continue to operate into 2028, MANE-VU and NHDES are interested in ensuring that short term emissions of NOx and SO_2 are well controlled to avoid contributing to visibility impairment on the 20% most impaired days at federally designated Class I areas in New Hampshire and in our region.

WVDAQ Comment: Relative to the five Inter-RPO "Asks"

1. a. All permitted EGUs with a nameplate capacity greater than 25 MW are equipped with NOx and SO_2 (for coal-fired units) controls in accordance with federally-enforceable Title V permits that are operated year round. Harrison Power Station meets BART and additional controls would be extremely high cost with little benefit.
   b. One EGU (Kammer) listed in Table 2-2 as contributing to visibility impairment in NH was closed and retired in 2015.
2. Harrison Power Station and Kammer are identified in Table 4-2 as facilities for which a four factor analysis should be performed. (Note that the table number is actually 4-9.) As described above, no additional controls are economically feasible at Harrison and Kammer is closed.
3. West Virginia does not believe that a low sulfur fuel is necessary for the state because a) distillate oil sales, particularly for residential home heating is very low and b) the proximity of West Virginia to the much larger MANE-VU market ensures that most oil sold in the state is already nearly all ultra-low sulfur.
4. All applicable EGUs already have permits that lock-in the lowest possible emission rates for NOx, SO_2, and PM. Industrial SO_2 sources listed in in Table 4-7 include a) Dupont Washington Works, that is now part of Chemours and is transitioning to natural gas under a consent order by 2021; b) Bayer Cropscience that has replaced three coal-fired boilers with two natural gas boilers and c) Capitol Cement that replaced kilns in 2009 and reduced SO_2 emissions.
5. This Ask, calling for decreasing energy demand through energy efficiency, and the use of combined heat and power and clean technologies like fuel cells, wind and solar, is beyond the scope of a regional haze SIP. Further, such fundamental changes to the energy market should not be suggested, particularly to other jurisdictions without prior discussion.

   NHDES Response: NHDES is grateful to WVDAQ for submitting information relevant to permit changes and shutdowns within WV. This information is pertinent and can be applied towards satisfying the MANE-VU Ask. Specifically:

1. a. Regarding the two units at Harrison Power Station, NHDES appreciates learning that the units have both SCR and FGD controls and that these controls typically exceed 95% emission reductions. WVDAQ mentioned that the federally enforceable permit allows less stringent NOx emissions outside the ozone season which is inconsistent with the MANE-VU Ask. The MANE-VU Ask considers that emission controls be operated at maximum reduction year round. WVDAQ goes on to state that additional controls "… would be extremely high cost with little benefit…" This suggests that WVDAQ has already completed a 4-factor analysis and determined that it is not reasonable to operate the SCR at peak reduction rates outside the ozone season, something that has been found to be reasonable at most MANE-VU state power plants. If this analysis has already been conducted and you are briefly summarizing it, please plan to include it in the WV SIP.
   b. We appreciate WVDAQ informing NHDES that Kammer Units 1, 2, and 3 have been shut down and are no longer a potentially contributing emission source. Obviously, a permanently shut down emission source does not need any demonstrations to satisfy this Ask or Ask #2.
2. If WVDAQ has already performed a 4-factor analysis on Harrison and determined that no additional controls are reasonable, then please include this information in the WV SIP.
3. NHDES estimates that over 13 million gallons of residential heating oil are burned per year in WV, which is more oil than some oil-fired, BART-applicable power plants in New England burn in a year. While WVDAQ believes that low sulfur fuel oil provisions in WV are not necessary, NHDES still believes it is reasonable for WV to perform an actual analysis on the matter. Despite nearby states having low

sulfur fuel mandates, it does not guarantee that suppliers are not using WV to dispense of their remaining higher sulfur fuel stock (in the MANE-VU region, this occurred in Pennsylvania). Alternatively, WVDAQ could opt to identify alternative equivalent measures to pursue.

4. Thank you for this information. We appreciate the efforts of WVDAQ to ensure that facilities that have, or are, switching to natural gas have updated permits that reflect appropriate emission limits for those fuels and emission controls.
5. Improving efficiency and lowering demand for fossil fuel generation is relevant to regional haze. Similar to many states, WVDAQ may not have the authority to mandate such actions, but energy efficiency is something environmental agencies can and should encourage and promote. Many states are pursuing renewable energy targets as strategic goals. Reducing demand allows for emission reductions which will improve visibility.

WVDAQ Comment: NH and MANE-VU failed to consult with jurisdictions outside of MANE-VU when developing the Inter-RPO Asks.

NHDES Response: During the Ask development process, the MANE-VU Class I area states collectively decided to bring specific requests into consultation and allowed for the opportunity for other states to react and/or propose alternatives. NHDES understands that WVDAQ knows its emission sources better than MANE-VU and if our suggested starting point for focusing efforts in evaluating potential emission reductions is not appropriate for WV, then WVDAQ should document the reasons for why that is the case in the WV SIP and provide alternate suggestions.

4. Public Comments

Sierra Club and National Parks Conservation Association Comment: The draft revision's proposed reliance on the NOx emission limit for Granite Shore Power's (GSP) Schiller Station (0.25 lbs NOx/MMBtu) allowed by their RACT order RO-003 is inconsistent with reasonable available control technology (RACT).

NHDES Response: Prior to RACT order RO-003, Units SR4 and SR6 at Schiller Station were subject to a NOx RACT limit of 0.50 lb/MMBtu of heat input based on a 24-hour calendar day average per NH Administrative Rule Env-A 1303.06(b). Schiller Station complied with this emission limitation through the use of combustion controls (i.e., low NOx burners and over-fire air) and post-combustion controls (i.e., SNCR) on an "as-needed" basis. Upon review of Schiller Station's historic NOx emissions for Units SR4 and SR6, the lowest NOx emission rates (24-hr calendar day averages) were achieved in 2007. As per the June 25, 2018 NOx RACT analysis submitted by GSP, SNCRs were operated year-round on both the boilers at that time. NHDES evaluated Units SR4 and SR6 calendar day average NOx emission rates for all days with at least 18 hours of operation. Using the 2007 daily averages as noted above the 95th percentile correlates to a NOx emission rate of 0.24 lb/MMBtu for each of Units SR4 and SR6. To provide a slight compliance margin, NHDES proposed a NOx RACT emission limit of 0.25 lb/MMBtu (24-hr calendar day average) for Units SR4 and SR6.

NHDES acknowledges that the final NOx RACT emission limit of 0.25 lb/MMBtu for Units SR4 and SR6 is higher than the presumptive NOx RACT limit of 0.12 lb/MMBtu adopted by New York for dry-bottom wall-fired coal boilers subcategory. Based on available data from EPA Clean Air Markets for utility boilers located within the Ozone Transport Region (OTR), the NOx rate of 0.12 lb/MMBtu has not been achieved in practice by coal boiler(s) similar in technology as Schiller Units SR4 and SR6 (i.e., dry bottom wall-fired coal boilers equipped with combustion controls and SNCR). The two coal-fired power plants referenced in Sierra Club's comments, Huntley Power and NRG Dunkirk Power did emit NOx at roughly 0.10 lb/MMBtu

(in 2014 and 2015 as per EPA Clean Air Markets). However, Dunkirk Unit 2 and Huntley Units 67 and 68 are dry bottom tangential-fired subbituminous coal burning boilers as opposed to Units SR4 and SR6 which are wall-fired bituminous coal burning boilers. NHDES understands that Huntley Units have been retired as of March 31, 2018 and Dunkirk may be converting to natural gas. Also, Dunkirk Unit 2 has not operated since 2016.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

May 7, 2019

Felice Janelle, Planning Analyst
Air Resources Division
New Hampshire Department of Environmental Services
P.O. Box 95
Concord, NH 03302-0095

Dear Ms. Janelle:

On February 26, 2019, New Hampshire Department of Environmental Services (NH DES) provided a pre-draft copy of the New Hampshire Regional Haze Plan Periodic Comprehensive Revision State Implementation Plan for EPA comment. We have reviewed the pre-draft and enclosed our comments and an annotated version of the pre-draft. If you have any questions, please call me or Anne McWilliams of my staff at 617-918-1697.

Sincerely,

Alison Simcox, Acting Manager
Air Quality Branch

Enclosures

Enclosure

Comments on New Hampshire's February 26, 2019 pre-draft New Hampshire Regional Haze Plan Periodic Comprehensive Revision

1. Since the submittal of the plans for the first regional planning period, EPA amended the regulatory requirements for state regional haze plans. *See 82 FR 3078, January 10, 2017.* In this rulemaking, EPA, among other actions, clarified the requirement that reasonable progress goals be set based on the long-term strategy. In other words, the reasonable progress goals should be based solely on federally enforceable provisions of the long-term strategy developed by states found to be contributing to the anthropogenic visibility impairment at a federal Class I area. While a downwind state is free to provide a recommendation regarding what is a reasonable control for an upwind source, the upwind source is under no obligation to implement this control if the upwind state's analysis determines that the control is not reasonable.

2. For any mandatory federal Class I area with incomplete data for 2000-2004, the state must establish baseline visibility values using the 5 complete years of monitoring data closest in time to 2000-2004. *See 51.308(f)(1)(i).* NH DES needs to revise the baseline visibility for the New Hampshire Class I areas.

3. New Hampshire should be consistent in the use of worst/most impaired visibility days and cleanest/clearest visibility days.

4. The New Hampshire Regional Haze SIP submittal reflects what the state is doing to address regional haze in Class I areas. While NHDES is encouraged to use technical work produced by the Mid-Atlantic/Northeast Visibility Union (MANE-VU), ultimately the SIP should reflect New Hampshire's methods and conclusions, not those of MANE-VU.

5. New Hampshire cited the state's recently adopted sulfur-in-fuel legislation as a component of the long-term strategy. These revised sulfur-in-fuel limits need to be federally enforceable in the SIP through incorporation of the statute, regulations, or operating permit limits.

6. NH DES should clearly state the components of the state's long-term strategy for the next planning period. If current controls are sufficient for the next planning period, NH DES should say so.

7. In a letter to MANE-VU dated April 12, 2019, the National Park Service requested that states review sources that may potentially impact Acadia National Park. Identified sources in New Hampshire include:

    a. PSNH – Schiller Station,
    b. Wheelabrator Concord Company LP,
    c. Monadnock Paper Mills Inc,
    d. Burgess Biopower, and

e. APC Paper Company.

The New Hampshire Regional Haze SIP should include a response to this Federal Land Manager request.

8. In developing a long-term strategy, NH DES is still required to consider: emission reductions due to ongoing air pollution control programs; measures to mitigate the impact of construction activities; source retirement and replacement schedules; and basic smoke management practices for prescribed fire. *See 51.308(f)(2)(iv).*

Additional comments are included in the attached annotated pre-draft of the New Hampshire Regional Haze Plan Periodic Comprehensive Revision.

United States Department of the Interior

NATIONAL PARK SERVICE
Air Resources Division
P.O. Box 25287
Denver, CO 80225-0287

TRANSMITTED VIA ELECTRONIC MAIL - NO HARDCOPY TO FOLLOW

N3615 (2350)

October 22, 2018

Jeffrey Underhill, Ph.D.
New Hampshire Department of Environmental Services
6 Hazen Drive
Concord, NH 03301

Dear Dr. Underhill:

As part of New Hampshire's development of a state implementation plan (SIP) for the second regional haze planning period (2018-2028), the National Park Service Air Resources Division would like to initiate consultation with the New Hampshire Department of Environmental Services (NHDES) to discuss which facilities the state is considering for possible future emission reductions.

Over the past 18 months, New Hampshire and the other MANE-VU states have completed a visibility contribution assessment (led by Toms Downs, MEDEP[1]), conducted facility screening analyses, and developed the MANE-VU Ask for Midwestern and eastern states to consider emission reduction measures for specific facilities and source categories by 2028. The Federal Land Managers (FLM) commented to MANE-VU on these technical analyses in 2016, 2017, and 2018.

In a letter dated April 12, 2018, the Air Resources Division provided MANE-VU with a list of facilities covering the MANE-VU states for discussion. Based on a signed but undated letter from MANE-VU, MANE-VU asked us to discuss source selection with individual states. Hence, our outreach to you via this letter.

As part of the FLM consultation process, we generated the attached list of facilities for consideration as the state prepares its reasonable progress SIP under the Regional Haze Rule. We would like to discuss this list in light of New Hampshire's list of sources for four factor analyses. The NPS developed the attached list of facilities using a Class I centric approach; that is, we

[1] Tom Downs, Maine Department of Environmental Protection (ME DEP). 2018. Mid-Atlantic/Northeast U.S. Visibility Data 2004-2016 (2nd RH SIP Metrics)

looked at the impact of eastern facilities on Acadia National Park (ACAD) and Shenandoah National Park (SHEN), the NPS Class I areas located in or nearest the MANE-VU states. For each NPS Class I area, we identified the facilities associated with contributing 80% of the impacts. In keeping with EPA's guidance, we adjusted the inventory to reflect those facilities that had been controlled, shut down, or changed fuels.

EPA 2016 draft guidance section 6.3 (p. 72)[2] states:

> Regardless of how it has selected its screening threshold for visibility impacts, the state should demonstrate that its threshold, in combination with other aspects of its screening approach, results in the screening process selecting for full analysis and decision a combination of major stationary sources, minor stationary sources and minor/area stationary source categories that collectively account for a reasonably large fraction of all the in-state major, minor and area stationary source emissions contributing to any PM species that is a significant portion of the anthropogenic extinction budget....The EPA considers 80 percent to be a reasonably large fraction for this purpose in the second planning period.

We would like to arrange a conference call with you in the next month to go over the facilities on our list that are located in New Hampshire to determine if those facilities are also on your list. Specifically we would like to discuss how the emissions from these facilities will change between 2018 and 2028 and which facilities will be evaluated as part of the state's long term strategy supporting continued visibility improvement in the Class I areas in MANE-VU states. Our goal is to better understand the NHDES's approach to this next round of regional haze planning.

We appreciate the opportunity to work with the NHDES to improve visibility in Class I national parks and wilderness areas. If you have questions, please contact Pat Brewer at 303-969-2153 or patricia_f_brewer@nps.gov.

Sincerely,

Carol McCoy
Chief, Air Resources Division

Attachment

Facilities potentially contributing to visibility impacts at Acadia or Shenandoah National Parks, using Q = combined NOx, PM2.5, SO2 and SO4 emissions by facility from the 2014 version 2 National Emissions Inventory or EPA's 2017 Clean Air Markets Database divided by d = distance from the facility to the nearest boundary of the national park.

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[2] U.S. EPA 2016 Draft Guidance on Progress Tracking Metrics, Long-term Strategies, Reasonable Progress Goals and Other Requirements for Regional Haze State Implementation Plans for the Second Implementation Period.

Year	Inventory	EIS ID	Facility Name	NAICS Code Description	Latitude	Longitude	State	Q	Distance to NPS Class I Area	Q/d	NPS Class I Area
2017	CAMD	7287811	Schiller	Fossil Fuel Electric Power Generation	43.098	-70.784	NH	529	200	2.65	ACAD
2017	CAMD	8178911	Merrimack	Fossil Fuel Electric Power Generation	43.141	-71.469	NH	550	247	2.23	ACAD
2014	NEI	7301111	WHEELABRATOR CONCORD COMPANY LP	Solid Waste Combustors and Incinerators	43.287	-71.576	NH	411	249	1.65	ACAD
2017	CAMD	CAMD	Burgess BioPower	Fossil Fuel Electric Power Generation	44.472	-71.175	NH	247	207	1.19	ACAD

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

MICHAEL ABRACZINSKAS
Director

NORTH CAROLINA
Environmental Quality

December 20, 2019

Craig A. Wright, Director
New Hampshire Department of Environmental Services
Air Resources Division
29 Hazen Drive, P.O. Box 95
Concord, NH 03302

Subject: New Hampshire's Draft Regional Haze SIP (2018-2028)

Dear Mr. Wright:

The North Carolina (NC) Division of Air Quality (DAQ) appreciates the opportunity to review New Hampshire's (NH) proposed *Regional Haze Plan, Periodic Comprehensive Revision, DRAFT 10/31/2019*. This letter provides the DAQ's comments on NH's proposed SIP.

Background

NH incorporated the Mid-Atlantic/Northeast Visibility Union (MANE-VU) Inter-RPO Ask in its proposed regional haze SIP.[1] The Inter-RPO Ask identifies NC as reasonably anticipated to contribute to visibility impairment in MANE-VU Class I areas including the Great Gulf and Presidential Range-Dry River (GGPRDR) Wilderness Areas located in New Hampshire's White Mountain National Forest. MANE-VU considered the results of a weight-of-evidence approach based on emissions (tons per year) divided by distance (kilometers) (Q/d) calculations, CALPUFF modeling, and HYSPLIT back trajectories to identify upwind states reasonably anticipated to contribute to visibility impairment at a MANE-VU Class I area. States that contributed ≥2% of the visibility impairment to a Class I area and had an average mass impact of over 1% (0.01 microgram per cubic meter), were identified for consultation, and included in the Inter-RPO Ask. Based on these results, MANE-VU concluded that its modeling and trajectory analyses appear to support NC as being a 2% contribution state.[2] Consequently, for NC, NH modeled potential emissions reductions associated with the Inter-RPO Ask control measures and included the emissions reductions in the control case for defining the long-term strategy (LTS) and reasonable progress goals (RPGs) for 2028 for the GGPRDR Wilderness Areas.

The DAQ participated in the consultation calls MANE-VU held with states included in the Inter-RPO Ask. The DAQ also submitted comments documenting significant concerns with MANE-VU's methodologies used to determine that NC as reasonably anticipated to contribute to visibility impairment in MANE-VU Class I areas. The DAQ reviewed MANE-VU's responses to the DAQ's questions and comments and believes that the technical questions the DAQ offered regarding the short-comings of

[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.
[2] *Selection of States for MANE-VU Regional Haze Consultation (2018)*, MANE-VU Technical Support Committee, Sept. 5, 2017.

MANE-VU's analyses were not adequately addressed by MANE-VU.[3] As articulated in the DAQ's comments on the Ask, the DAQ still believes that the MANE-VU methodologies resulted in inaccurate conclusions that emissions from NC are "reasonably anticipated" to contribute to visibility impairment in MANE-VU Class I areas. The DAQ has included its comments on the MANE-VU Inter-RPO Ask as an attachment to this letter, and requests that NH consider these comments in its final regional haze SIP.

The following comments on the NH SIP address (1) why NH should not include in the LTS/RPG for the GGPRDR Wilderness Areas control measures identified in the MANE-VU Ask for upwind states such as NC, and (2) why the DAQ believes that NC is not "reasonably anticipated" to contribute to visibility impairment for the GGPRDR Wilderness Areas.

Long-Term Strategy (LTS) and Reasonable Progress Goals (RPG)

As stated on pages 16 and 27 of NH's proposed SIP, NH identified NC as a state reasonably anticipated to contribute to visibility impairment at the GGPRDR Wilderness Areas and, therefore, included in the LTS/RPG for these areas control measures originating from the MANE-VU Inter-RPO Ask.[4] The DAQ strongly disagrees with the inclusion of the control measures for NC in the LTS/RPG for the GGPRDR Wilderness Areas because the DAQ has not agreed to adopt any of the measures and, for this reason, would be inconsistent with the regional haze rule and U.S. Environmental Protection Agency's (EPA) regional haze guidance.

Section 51.308(f)(2) of the Regional Haze Rule requires SIPs to include *...enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress as determined pursuant to (f)(2)(i) through (iv).*" With respect to consultation with upwind states, Section 51.308(f)(2)(ii)(A) of the rule requires that: *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.*[5]

In addition, EPA's regional haze guidance document reinforces the need for a downwind and an upwind state to agree on control measures for the upwind state before the upwind state control measures are to be included in the downwind state's LTS/RPGs. Under Step 6 of EPA's guidance, in Footnote #80, EPA states that: *...If another contributing state has not yet even determined the measures that are necessary to make reasonable progress at the jointly affected Class I area, then the state with the Class I area must set the RPGs based on whatever measures that the contributing state has actually adopted to meet the requirements for the first implementation period and other CAA requirements. The state with the Class I area may not base its RPGs on speculation about what another state will do.*[6]

The DAQ has not agreed with NH or any other MANE-VU state to include any control measures, including those included in the Inter-RPO Ask, in any LTS for setting RPGs for the GGPRDR Wilderness Areas or any other MANE-VU Class I Federal area. Therefore, the DAQ requests that NH revise its LTS/RPG for the GGPRDR Wilderness Areas to exclude the control measures identified in the Inter-RPO Ask and NH's proposed regional haze SIP. Should NH decide to include the Inter-RPO Ask control measures for NC in the final SIP for the GGPRDR Wilderness Areas, doing so will be inconsistent with the requirements of Section 51.308(f)(2) of the regional haze rule because the measures will not be federally enforceable.

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[3] *MANE-VU Regional Haze Consultation Report*, July 27, 2018, MANE-VU Technical Support Committee.
[4] See Chapter 3 (Regional Planning and Consultation), Section 3.2.1 (Selection of States for MANE-VU Inter-RPO Regional Haze Consultation) of NH's proposed Regional Haze SIP.
[5] 40 CFR § 51.308(f) - Regional haze program requirements, requirements for periodic comprehensive revisions of implementation plans for regional haze.
[6] *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*, EPA-457/B-19-003, August 2019.

Upwind State Contributions to the GGPRDR Wilderness Areas

The DAQ documented in its comments on the Inter-RPO Ask several technical concerns with the screening methodologies explaining why it is inappropriate for MANE-VU to use the results to draw any conclusions regarding NC's contribution to visibility impairment in any of the MANE-VU Class I areas. Instead, the DAQ recommended that MANE-VU conduct state-of-the-art photochemical grid and source apportionment modeling to evaluate upwind state contributions to visibility impairment in Class I areas.

MANE-VU completed Community Multiscale Air Quality (CMAQ) photochemical grid modeling for 2011 and 2028 for regional haze but did not conduct zero-out runs to evaluate upwind state contributions to the GGPRDR Wilderness Areas and other MANE-VU Class I areas.[7] In addition, EPA and the Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) recently completed separate regional haze modeling studies using the Comprehensive Air Quality Model with Extensions (CAMx) photochemical grid model. The following table compares the uniform rate of progress (URP) and the modeling results from each study for the GGPRDR Wilderness Areas in 2028 for the 20% most impaired days. The three modeling studies predict impacts below the URP for the GGPRDR Wilderness Areas in 2028. VISTAS modeling shows an impact that is 0.81 dv and 0.77 dv above the MANE-VU and EPA modeling results, respectively. The modeling results are reasonably close given the different modeling platforms and year of meteorology data used in these studies.

Comparison of URP and Photochemical Grid Modeling of Visibility Impairment for the GGPRDR Wilderness Areas in 2028 for 20% Most Impaired Days

Conditions	Deciviews
Unadjusted Uniform Rate of Progress for 2028 (EPA)[8]	17.07
MANE-VU/OTC – CMAQ/2011 Meteorological Data[9]	12.13
VISTAS – CAMx/2011 Meteorological Data	12.94
EPA – CAMx/2016 Meteorological Data[10]	12.17

For each VISTAS state, VISTAS also conducted Particulate Matter Source Apportionment Technology (PSAT) source apportionment modeling for sulfate and nitrate to evaluate statewide contributions of emissions to visibility impairment in Class I areas. Sulfate and nitrate were evaluated because these two pollutants currently account for the majority of the visibility impairment associated with anthropogenic sources in the VISTAS and MANE-VU regions. Figure 1 shows the combined impact of sulfate and nitrate on visibility impairment for the GGPRDR Wilderness Areas in 2028. As these results show, NC's total sulfate and nitrate contribution to visibility impairment in 2028 to the GGPRDR Wilderness Areas is 0.18% for the 20% most impaired days and 0.03% for the 20% clearest days.

Documentation of the VISTAS modeling and results is currently undergoing review by the VISTAS state and local agencies and tribal authorities. Although the modeling results are considered preliminary, VISTAS does not anticipate that the over-arching conclusions (e.g., NC is not a significant contributor to visibility impairment to the GGPRDR Wilderness Areas or any other MANE-VU Class I area) will change. Once finalized, VISTAS will make the modeling results and documentation available to the public.

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[7] NH's proposed Regional Haze SIP containing the document titled: *Ozone Transport Commission/Mid Atlantic Northeastern Visibility Union 2011 Based Modeling Platform Support Document October 2018 Update*, 2nd Version October 18, 2018.

[8] From Table 3-3 in *Technical Support Document for EPA's Updated 2028 Regional Haze Modeling*, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, September 2019.

[9] Modeled without the MANE-VU Ask measures, see Table 12-8 in Appendix V *(*file named *"r-ard-19-01-appendix-v.pdf")* of NH's proposed regional haze SIP.

[10] From Table 3-2 in *Technical Support Document for EPA's Updated 2028 Regional Haze Modeling*, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, September 2019.

Relative to the screening methodologies used by MANE-VU, photochemical grid and source apportionment models are regarded as superior to other techniques like Q/d and CALPUFF for determining statewide contributions because the models account for meteorological conditions and photochemistry over long distances that are not fully addressed by the screening methodologies. In addition, state contributions to visibility impairment in Class I areas should be calculated for 2028, not 2015, to allow states to coordinate regional haze planning with other regulatory programs including, but not limited to, the 2010 1-hour SO_2 National Ambient Air Quality Standard (NAAQS), the 2012 annual $PM_{2.5}$ NAAQS, the 2015 8-hour ozone NAAQS, and the Mercury and Air Toxics Standards (MATS) rule.[11] This point is supported by EPA's regional haze guidance which recommends the use of 2028 year emissions for calculating baseline visibility impacts before selecting sources for further analysis.[12]

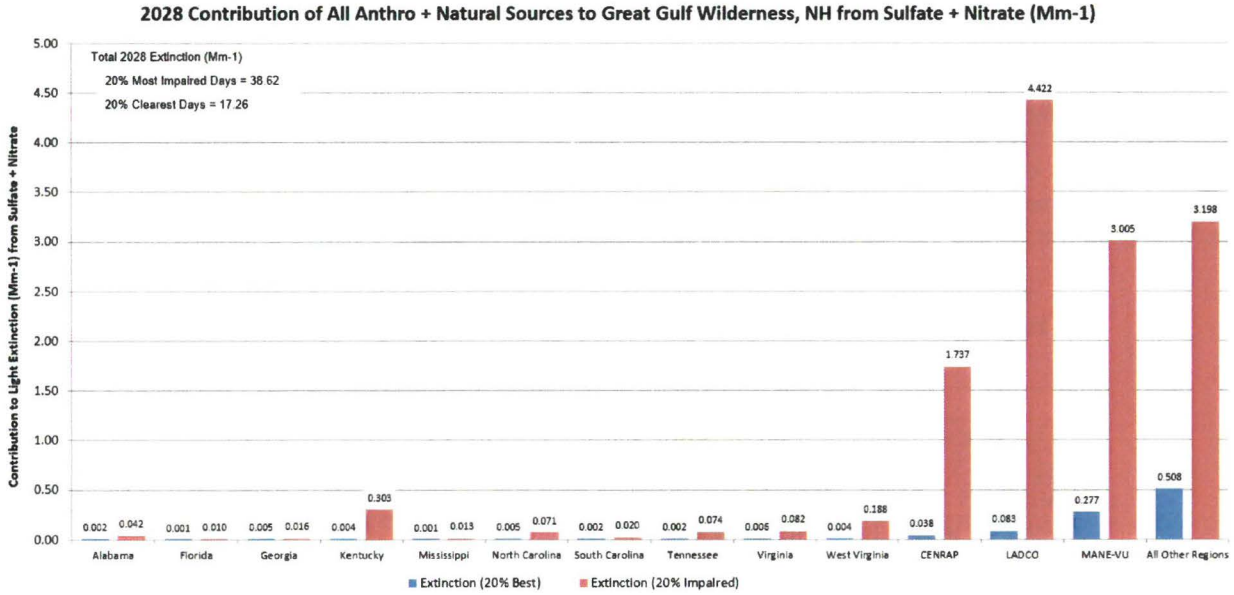

Figure 1. Contribution of All Sources to GGPRDR Wilderness Areas from Sulfate and Nitrate (Mm-1)

The DAQ believes that use of photochemical and source apportionment models such as CAMx/PSAT provide a much more accurate estimate of statewide contributions to visibility impairment in Class I areas than the screening methodologies used by MANE-VU to identify contributing states. Given the VISTAS modeling results, NC's contribution to visibility impairment to the GGPRDR Wilderness Areas is well below the 2% threshold established by MANE-VU and; therefore; the DAQ requests that NC be removed from NH's list of states considered to be reasonably attributing to visibility impairment at the GGPRDR Wilderness Areas.

[11] EPA extended the deadline for states to submit their second-round regional haze SIPs from July 31, 2018 to July 31, 2021 to provide states the opportunity to coordinate development of regional haze SIPs with other federal regulatory programs. See *Protection of Visibility: Amendments to Requirements for State Plans*, Final rule, 82 FR 3117.

[12] *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*, EPA-457/B-19-003, August 2019. See Step 3(a) "Estimating baseline visibility impacts for source selection", page 17.

Conclusions

Based on the CAMx/PSAT modeling conducted by the VISTAS states, NC's statewide contribution to visibility impairment in the GGPRDR Wilderness Areas is significantly below the 2% contribution threshold that the MANE-VU states used to identify upwind states as reasonably anticipated to contribute to visibility impairment in MANE-VU Class I areas. As the DAQ noted in its comments on the MANE-VU Inter-RPO Ask, the DAQ believes that MANE-VU's screening methodologies are flawed in several areas and overstate upwind contributions to downwind state Class I areas. The DAQ also strongly disagrees with NH applying the MANE-VU Inter-RPO Ask control measures in the LTS/RPG for the GGPRDR Wilderness Areas as doing so would be inconsistent with the regional haze rule and guidance.

Thank you for the opportunity to comment on the Inter-RPO Ask. I hope that these comments are helpful, and I look forward to continuing to work with you and the MANE-VU states to develop reasonable regional haze SIPs. Please contact Randy Strait (randy.strait@ncdenr.gov) of my staff at 919-707-8721 if you have any questions regarding this matter.

Sincerely,

Michael A. Abraczinskas, Director
Division of Air Quality, NCDEQ

MAA/rps

Attachment

cc: Michael Pjetraj, NCDAQ
Randy Strait, NCDAQ

Air Quality
ENVIRONMENTAL QUALITY

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

MICHAEL A. ABRACZINSKAS
Director

February 16, 2018

David Foerter
Ozone Transport Commission
444 N Capitol St NW Ste 322
Washington DC 20001-1529

Re: MANE-VU Regional Haze Consultation

Dear Mr. Foerter:

As you know, the Mid-Atlantic/Northeast Visibility Union (MANE-VU) identified North Carolina as one of 14 upwind states that may reasonably contribute to visibility impairment at MANE-VU Federal Class I areas located in Maine, New Hampshire, New Jersey, and Vermont (hereafter referred to as the "Inter-Regional Planning Organization (Inter-RPO) Ask or Ask).[1] At your invitation, the North Carolina Division of Air Quality (DAQ) has participated in each of the consultation calls MANE-VU held with the states identified in the Inter-RPO Ask.[2] These consultation calls have been helpful for understanding the technical analyses MANE-VU completed to identify states that may reasonably contribute to visibility impairment at MANE-VU Class I areas. The DAQ has also reviewed the technical documentation supporting the Ask. In the spirit of the consultation process, the DAQ is submitting this letter to share information, and express North Carolina's concerns with MANE-VU's analytical approach and conclusions as well as the timing for regional haze state implementation plan (SIP) submittals.

I. KapStone Kraft Paper Corporation (Facility ID 8048011 (3708300007), Unit ID ST-1,2 (ES-11-CU-001) - No. 1 Power Boiler)

The power boiler at Kapstone was identified in the MANE-VU Ask as having the potential for a 6.0 inverse megameter (Mm^{-1}) light extinction impact on MANE-VU Class I areas based on CALPUFF modeling of the facility's 2011 sulfur dioxide (SO_2) and nitrogen oxide (NOx) emissions. The DAQ reviewed the modeling documentation and found that the maximum potential light extinction impact modeled for the power boiler was 0.28 Mm^{-1} for MANE-VU Class I areas and 0.47 Mm^{-1} for Class I areas near the MANE-VU region (see Table 1). On January 31, 2018, the DAQ confirmed with Mr. David Healy, New Hampshire Department of Environmental Services, that the 6.0 Mm^{-1} extinction value shown in the Inter-RPO Ask for Kapstone Unit ST-1,2 is wrong. Mr. Healy confirmed that the extinction values shown in Table 1 below are correct for the power boiler and that the unit should not be included in the Ask. Therefore, we request that MANE-VU remove Kapstone from the Inter-RPO Ask.

[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.
[2] Letter from Foerter, Dave, Executive Director, MANE-VU/OTC to Regan, Michael, Secretary, NCDEQ, October 16, 2017.

Table 1. Summary of Potential Visibility Impacts on MANE-VU and Nearby Federal Class I Areas Modeled for the KapStone Kraft Paper Corporation Power Boiler[1]

		Estimated Extinction (Mm^{-1})			
Region	**Class I Area**	**Maximum Potential Visibility Impact**	**Met Year 2002**	**Met Year 2011**	**Met Year 2015**
MANE-VU	Acadia National Park, ME	0.08	0.076	0.07	0.07
	Brigantine Wilderness Area, NJ	0.28	0.22	0.24	0.28
	Great Gulf Wilderness Area, NH	0.07	0.05	0.04	0.07
	Lye Brook Wilderness Area, VT	0.12	0.05	0.08	0.12
	Moosehorn Wilderness Area, ME	0.07	0.07	0.06	0.06
	Presidential Range Dry River Wilderness Area, NH	0.08	0.058	0.05	0.08
	Roosevelt Campobello International Park, ME/NB, Canada	0.06	0.06	0.06	0.05
Near MANE-VU	Dolly Sods Wilderness Area, WV	0.15	0.1	0.15	0.11
	James River Face Wilderness Area, VA	0.47	0.47	0.26	0.3
	Otter Creek Wilderness Area, WV	0.12	0.12	0.11	0.1
	Shenandoah National Park, VA	0.32	0.25	0.32	0.23

[1] Reference: 2016 MANE-VU Source Contribution Modeling Report, CALPUFF Modeling of Large Electrical Generating Units and Industrial Sources, Appendix F, April 4, 2017. CALPUFF modeling was performed using meteorological data for 2002, 2011, and 2015 and the highest light extinction impact was used as the maximum potential visibility impact.

In addition, the Kapstone facility has significantly reduced its SO_2 and NOx emissions since 2011. This would result in extinction values much lower than the modeling showed based on 2011 emissions.

- From 2011 to 2016, total facility SO_2 emissions have decreased by 94% (from 881 tons in 2011 to 55 tons in 2016) primarily due to SO_2 reductions from the No. 1 power boiler. The No. 1 power boiler accounted for 91% (803 tons) of total facility SO_2 emissions in 2011, and 68% (37 tons) in 2016.
- From 2011 to 2016, total facility NOx emissions have decreased by 13% (from 1,413 tons in 2011 to 1,232 tons in 2016). The No. 1 power boiler accounted for 71% (1,005 tons) of total facility NOx emissions in 2011, and 67% (820 tons) in 2016.

The DAQ will submit the latest 2016 emissions data for this facility to MANE-VU to support future modeling updates.

II. Statewide Contribution Assessment

The DAQ reviewed the following two documents in an effort to understand MANE-VU's statewide contribution assessment:

1. Selection of States for MANE-VU Regional Haze Consultation (2018), MANE-VU Technical Support Committee, Sept. 5, 2017.

2. MANE-VU Updated Q/d*C Contribution Assessment, MANE-VU Technical Support Committee, April 6, 2016.

As noted in these documents, MANE-VU considered the results of a weight-of-evidence approach based on emissions (tons per year) divided by distance (kilometers) (Q/d) calculations, CALPUFF modeling, and HYSPLIT back trajectories to determine which upwind states may reasonably contribute to visibility impairment at a MANE-VU Class I area. States that contributed 2 percent or more of the visibility impairment to a Class I area, and had an average mass impact of over 1 percent (0.01 microgram per cubic meter ($\mu g/m^3$)), were identified for consultation, and, therefore, included in the Inter-RPO Ask. Sulfur dioxide and NOx emissions for 2015 for all anthropogenic sources were considered in the assessment. The results for North Carolina are provided in Tables 2 and 3.

Table 2. Percent Mass-Weighted Sulfate and Nitrate Contributions from North Carolina to MANE-VU Class I Areas in 2015

Maximum	Acadia	Brigantine	Great Gulf	Lye Brook	Moosehorn	Mass Factor
2.7%	2.7%	2.7%	2.1%	2.3%	2.2%	0.34

Table 3. Percentage of Trajectories from North Carolina in 2015 on 20% Most Impaired Visibility Days[1]

Acadia	Brigantine	Great Gulf	Lye Brook	Moosehorn
0.55%	2.00%	0.00%	1.84%	1.22%

[1] 500 meter (m) trajectories were modeled using the HYSPLIT model, and 72-hour back trajectories were created 4 times per day at 3AM & PM and 9AM & PM. 2015 trajectories used the Eta Data Assimilation System (EDAS) 40-kilometer (km) meteorology. Trajectory points were mapped and counted within 25 x 25 mile grid cells.

Based on these results, MANE-VU concluded that, "*Modeling and trajectory analyses appear to support Alabama, North Carolina and Tennessee as being 2% contribution states. Each has sufficient emissions to cause some degree of visibility impact in the MANE-VU area and the trajectories suggest a connection on 20% most impaired visibility days, even if they are not as frequent as other states.*"

Although the DAQ was unable to fully understand the methodologies that MANE-VU applied due to a lack of documentation in the two references reviewed, the following identifies serious technical limitations with the information presented.

Q/d Screening Tool

The Q/d screening methodology yields conservatively high estimates of potential impacts for the following reasons:

1. Q/d does not account for the formation of secondary particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$) through chemical reactions as a function of distance. Consequently, Q/d assumes 100 percent conversion of SO_2 and NOx to ammonium sulfate ($(NH_4)_2SO_4$ and ammonium nitrate ($(NH_4)NO_3$)), respectively, which is overly conservative and yields unrealistic estimates.[3]
2. Q/d does not account for wind direction or residence time (i.e., the amount of time a pollutant impacts a given area). MANE-VU attempted to correct for this limitation, in part, by developing wind-

[3] US EPA, Interagency Work Group on Air Quality Modeling Phase 3 Summary Report: Near-Field Single Source Secondary Impacts. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Analysis Division, Air Quality Modeling Group, Research Triangle Park, NC, EPA-454/P-15-002, July 2015, pages 23-24.

direction-specific constants for each IMPROVE monitor (based on prior CALPUFF modeling for point sources) to "scale" Q/d results. However, the details of this methodology is not documented in the references we reviewed; consequently, the DAQ cannot determine if this is a reasonable approach for screening purposes. The Brigantine Wilderness Area in New Jersey, which is the closest MANE-VU Class I area to North Carolina, is located about 507 km (315 miles) from the centroid of the closest point to North Carolina, and 635 km (394 miles) from the centroid of North Carolina. The DAQ does not believe that the MANE-VU screening methodology is robust enough to determine visibility impairment attribution at these long distances.

3. For the stationary non-point and mobile source sectors, MANE-VU did not provide documentation of how it prepared 2015 year emissions. The DAQ requests that MANE-VU provide this documentation for review and comment by the upwind states. Furthermore, MANE-VU cited several references justifying the use of Q/d as a screening tool for assessing potential visibility impacts of these sources on Class I areas. The DAQ reviewed these references and found that they all focus on using Q/d as a screening tool for large point sources only; not surface emissions from stationary non-point and mobile sources.[3,4,5,6] The DAQ believes that Q/d applied to the sum of total statewide annual emissions for stationary non-point and mobile sources at the state centroid results in significantly high impacts especially since Q/d does not account for atmospheric dispersion or residence time of pollutants impacting a Class I area.

Back-Trajectory Analysis

MANE-VU modeled back trajectories for the 20 percent most impaired visibility days during 2002, 2011 and 2015 at each of the MANE-VU Class I areas. MANE-VU used the back-trajectory results to qualitatively cross-check with the screening results to justify including states in MANE-VU Inter-RPO Ask. If an upwind state was determined to have a 2 percent or more impact on a MANE-VU Class I area and it had at least one trajectory originating from the upwind state, MANE-VU included the state in the Ask. The MANE-VU documentation does not identify the days during which or the number of trajectories originating from North Carolina. Given the low percentage of trajectories originating from North Carolina in 2015 (see Table 3), the DAQ believes that the back-trajectory analysis shows that North Carolina should not be considered as reasonably attributing to visibility impairment in any of MANE-VU's Class I areas, particularly when the screening analysis overestimates potential impacts. For distant-source regions, the trajectory threshold should be much higher to definitively assign culpability.

The DAQ further questions why MANE-VU used the course Eta Data Assimilation System (EDAS) 40-km meteorology for its 2011 and 2015 analysis, and EDAS 89-km meteorology for its 2002 analysis, instead of using the North American Mesoscale Forecast System (NAM) model with a 12-km grid for HYSPLIT trajectory modeling. The NAM model has become the model of choice not just for DAQ but also for EPA and other air quality agencies and RPOs for HYSPLIT trajectory modeling. Furthermore, the DAQ questions MANE-VU's selective use of meteorological years 2002, 2011 and 2015, instead of across consecutive years (e.g., 2011-2015). The DAQ believes that use of more current year emissions and meteorology would significantly improve the contribution assessment for MANE-VU Class I areas.

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[4] National Association of Clean Air Agencies, *PM2.5 Modeling Implementation for Projects Subject to National Ambient Air Quality Demonstration Requirements Pursuant to New Source Review*, Report from NACAA PM2.5 Modeling Implementation Workgroup, January 7, 2011, page 2-4 and Appendix E.

[5] Baker, K. R. and Foley, K. M., "A Nonlinear Regression Model Estimating Single Source Concentrations of Primary and Secondarily Formed PM2.5," July 2011.

[6] Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report—Revised (2010) Natural Resource Report NPS/NRPC/NRR—2010/232, US Forest Service, National Park Service, and U.S. Fish and Wildlife Service, October 2010.

Basis for Determining Reasonable Attribution

The documentation the DAQ reviewed did not explain the technical basis for the visibility impairing thresholds that MANE-VU used to include states in the Inter-RPO Ask. This is important for states such as North Carolina to understand and to have the opportunity to address since MANE-VU is claiming that North Carolina is reasonably attributing to visibility impairment in one or more of MANE-VU's Class I areas. Given the significant uncertainty associated with the Q/d screening tool, the weakness of the back-trajectory analysis, and lack of documentation explaining how MANE-VU arrived at the contribution results shown in Table 2, the DAQ believes it is inappropriate for MANE-VU to use these results to draw any conclusions regarding North Carolina's contribution to visibility impairment in any of the MANE-VU Class I areas. The DAQ requests that MANE-VU provide additional documentation explaining the basis for the thresholds.

IV. Timing of SIP Submittals

We request that MANE-VU states seriously consider delaying submittal of their regional haze state implementation plans (SIPs) from July 2018 to July 2021. As EPA noted in its final regional haze rule,[7] extension of the SIP submittal date to July 2021 "...will allow states to coordinate regional haze planning with other regulatory programs, including but not limited to the Mercury and Air Toxics Standards,[8] the 2010 1-hour SO_2 NAAQS,[9] the 2012 annual $PM_{2.5}$ NAAQS[10] and the Clean Power Plan,[11] with the further expectation that this cross-program coordination would lead to better overall policies and enhanced environmental protection." In addition, EPA has yet to release its final regional haze guidance document which, when released, may contain significant revisions to the draft guidance document released on June 30, 2016 that would affect the process for identifying state(s) as reasonably attributing to visibility impairment in downwind state Class I areas.[12] It is for these reasons that North Carolina is working with the nine other Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) states to complete our regional haze modeling analysis in mid-2019 and regional haze SIP by July 2021. The differing schedules have resulted in seven VISTAS states being asked to assess the MANE-VU analysis without the benefit of the forthcoming VISTAS technical work. Accounting for the emission reduction benefits associated with the federal programs EPA cited in its rule and following the final regional haze guidance issued by EPA will help to ensure that upwind states such as North Carolina are not falsely implicated as contributing to visibility impairment at MANE-VU Class I areas.

In addition, on January 18, 2018, EPA announced its decision to revisit aspects of the 2017 regional haze rule.[13] While the extent of the review is uncertain, the potential exists that EPA could modify certain regional haze provisions prior to the July 2021 SIP submittal deadline that may affect state obligations under the rule. The MANE-VU states should allow time for EPA to complete its revisit to the rule and for the VISTAS analysis to be completed and shared before submitting SIPs incorporating any new emission control presumptions directed at the VISTAS states.

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[7] 82 FR 3116-3118, January 10, 2017.
[8] 77 FR 9304, February 16, 2012.
[9] 75 FR 35520, June 22, 2010.
[10] 78 FR 3086, January 15, 2013.
[11] 80 FR 64662, October 23, 2015. The Clean Power Plan was stayed by the Supreme Court for the duration of litigation. Order in Pending Case, West Virginia v. EPA, No. 15A773 (February 9, 2016). As a result, states have no compliance obligations with respect to the Clean Power Plan at this time.
[12] Draft Guidance on Progress Tracking Metrics, Long-term Strategies, Reasonable Progress Goals and Other Requirements for Regional Haze State Implementation Plans for the Second Implementation Period, June 30, 2016.
[13] EPA's Decision to Revisit Aspects of the 2017 Regional Haze Rule Revisions, https://www.epa.gov/visibility/epas-decision-revisit-aspects-2017-regional-haze-rule-revisions.

In our SIP, North Carolina will rely on VISTAS II regional-scale modeling for 2028 using the Comprehensive Air Quality Model with Extensions (CAMx) model with the Particulate Matter Source Apportionment Technology (PSAT) source apportionment method for assessing source contributions to Class I areas. This work will also be used to determine if North Carolina has a significant anthropogenic emissions source contribution to visibility impairment in each of MANE-VU's Class I areas. By delaying submittal of MANE-VU state regional haze SIPs until July 2021, North Carolina will be able to share more current emissions and modeling data with the MANE-VU states to determine if North Carolina emissions reasonably contribute to visibility impairment in any of the MANE-VU Class I areas.

IV. Summary and Conclusions

In closing, the DAQ welcomes the opportunity to consult with MANE-VU on the quality of data and analytical techniques used to determine reasonable attribution in MANE-VU Class I areas. As previously noted, the DAQ has serious concerns with the information included in the Inter-RPO Ask for North Carolina. First, I request that MANE-VU revise the Inter-RPO Ask to exclude the power boiler at Kraft Paper Corporation that was incorrectly included in the Ask.

Second, the statewide contribution assessment contains significant uncertainty associated with the Q/d screening tool (especially applied to stationary non-point and mobile source emissions) and back-trajectory analysis, and the technical documentation lacks clarity on how MANE-VU arrived at the contribution results shown in Table 2. For these reasons, the DAQ believes it is inappropriate for MANE-VU to use these results to draw any conclusions regarding North Carolina's contribution to visibility impairment in any of the MANE-VU Class I areas. In addition, the DAQ believes that MANE-VU has not demonstrated the need for North Carolina to pursue adoption and implementation of the emissions management measures MANE-VU included in its Inter-RPO Ask.

Finally, North Carolina recommends that MANE-VU take the additional time allowed by EPA to conduct CAMx and PSAT modeling such as VISTAS II is doing to determine if North Carolina reasonably attributes to visibility impairment in MANE-VU's Class I areas. Meanwhile, North Carolina is working with the VISTAS states to complete its CAMx and PSAT modeling and will rely on this modeling to assess its visibility impact on in-state and downwind state Class I areas. North Carolina will share this information with MANE-VU when it becomes available in 2019.

Thank you for the opportunity to comment on the Inter-RPO Ask. I hope that these comments are helpful and I look forward to continuing to work with you and the MANE-VU states to develop reasonable regional haze SIPs.

Sincerely,

Michael Abraczinskas, Director
Division of Air Quality, NCDEQ

MAA/rps

cc: Michael Pjetraj, DAQ
Sushma Masemore, DAQ
Randy Strait, DAQ

Commonwealth of Virginia

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December 20, 2019

Mr. Craig Wright, Director
New Hampshire Department of Environmental Services
Air Resources Division
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Dear Mr. Wright,

Thank you for providing the Virginia Department of Environmental Quality (DEQ) the opportunity to comment on your proposed Regional Haze State Implementation Plan (SIP), *New Hampshire Regional Haze Plan Periodic Comprehensive Revision DRAFT 10-31-2019.* This proposal describes New Hampshire's long term plan for addressing visibility-impairing pollution at the Great Gulf Wilderness Area and the Presidential Range-Dry River Wilderness Area. DEQ does not agree with all aspects of the technical analysis for this next planning period as provided in your proposal. DEQ also recommends that New Hampshire's assessment of the reasonable progress goals (RPGs) for these areas not rely on emission reductions from certain controls, as described in Section 4.2.4 of this proposal.

Section 2 in the proposal describes the screening process for evaluation of additional controls to determine which states should be the subject of consultation and should employ emission control programs. This screening process includes the use of emissions estimates divided by distance (Q/d) and CALPUFF results. Figure 2.4 shows the estimated 2011-2015 percent mass-weighted sulfate and nitrate contribution from Virginia to be just over 2% at New Hampshire's Class I areas. Table 2-2 provides data on electrical generating units (EGUs), relying on CALPUFF results and 2015 Clean Air Markets Division (CAMD) hourly emissions estimates to evaluate estimated contributions to visibility impairment at Great Gulf Wilderness Area. This table lists the estimated extinction contribution from Yorktown Power Station Unit #3 to be 3.6 inverse megameters (Mm^{-1}) and from Yorktown Power Station Units #1 and #2 to be 1.5 Mm^{-1}.

DEQ does not believe that such screening methodologies for the evaluation of reasonable progress should be based on 2011 emissions and 2015 CAMD EGU emissions. Rather, 2028 emission projections should be used for such evaluations. On August 20, 2019, the U.S. Environmental Protection Agency (EPA) published a guidance memorandum, *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*. The EPA guidance states on page 17:

> All of the techniques described above require estimates of source emissions. Generally, we recommend that states use estimates of 2028 emissions (resolved by day and hour, as appropriate) to estimate visibility impacts (or related surrogates) when selecting sources, rather than values of recent year emissions.

DEQ recommends that New Hampshire base any evaluation of visibility impact at its Class I areas on 2028 estimates of emissions. Using 2028 emission estimates will ensure that the latest information concerning plant closures, controls, fuel switches and other impacts are considered within the screening process. Additionally, such changes could impact percent contributions.

For example, use of 2028 emission estimates rather than 2015 emission estimates could change conclusions concerning Yorktown Power Station. Units #1 and #2 have retired. Yorktown #3 is an 882 MW oil-fired EGU located in Yorktown, Virginia, over 400 miles straight line distance from Great Gulf Wilderness Area. The unit is subject to 40 CFR Part 63 Subpart UUUUU *National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units* (MATS rule). Under the MATS rule, the unit operates as a limited-use, liquid oil-fired unit such that its annual capacity factor is less than 8%, averaged over a 24-month period. While capable of generating a significant amount of electricity, the unit operates infrequently. The following table provides the annual SO_2 emissions for 2013-2018 from this unit:

Table 1: Yorktown #3 SO2 Emissions from CAMD

Year	SO_2 Emissions, tpy
2013	399
2014	909
2015	2,070
2016	635
2017	269
2018	821

For this unit, ERTAC 16.0 results estimate 2028 SO_2 emissions to be approximately 368 tpy. IPM 6.0 results for both 2023 and 2030 estimate no activity or emissions from this unit. Dominion Energy's Integrated Resource Plan for 2018 indicates the unit may retire

in 2022.[1] Emissions data from 2015 used in the New Hampshire analysis are significantly higher than any of these estimates of 2028 activity.

Therefore, DEQ strongly recommends that New Hampshire's analysis rely upon 2028 emission estimates, both for Q/d analyses and for visibility impairment analyses, so that such estimates can take into account current knowledge of units, expected controls and growth in certain sectors, and the relative magnitudes of future year emissions from other sources and states.

Also important to note is that estimates of impact developed by the Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) for the southeastern states' Regional Haze submittals show 0.082 Mm^{-1} as the sulfate and nitrate contribution to light extinction from all anthropogenic sources within Virginia in 2028 to the Great Gulf Wilderness Area. This value, based on recently completed CAMx (PSAT) modeling, equates to 0.62% of the total anthropogenic visibility impairment estimated for 2028 at Great Gulf Wilderness Area. Based on this analysis, which relies on state-of-the-science modeling techniques and 2028 inventory projections as recommended by EPA guidance, the entirety of Virginia's 2028 emissions are estimated to contribute much less than 2% to visibility impairment at Great Gulf Wilderness Area. All of Virginia should be screened out based on the VISTAS projections using the New Hampshire visibility impact contribution threshold.

Virginia supports the VISTAS approach of using PSAT in CAMx as opposed to CALPUFF because CAMx is considered to have more robust chemistry (both gas and aqueous phase). In addition, improved spatial and temporal representation of ammonia and nitric acid concentrations, combined with inorganic chemistry in CAMx, allow for more realistic nitrate partitioning between the gas and particle phases. Finally, CALPUFF, a Langrangian puff model, has a tendency to over-predict impacts at large downwind distances when compared to an Eulerian photochemical grid model such as CAMx. These considerations are especially important given the distances between Virginia facilities such as Yorktown Power Station and the Great Gulf Wilderness Area or the Presidential Range-Dry River Wilderness Area.

Also of concern to DEQ are the proposed Great Gulf Wilderness Area and Presidential Range – Dry River Wilderness Area RPGs. In Figure E-1, the listed RPG for 2028 is 12.0 dv. In Table 4-6 and Table 4-10, the listed RPG is 12.00 dv based on emissions estimates that include MANE-VU Ask measures and 12.13 based on projections exclusive of MANE-VU Ask measures. If the RPG for these areas is projected from a platform considering only on-the-books and on-the-way controls, DEQ recommends clarifying the numerical value for the RPG for these areas and clearly documenting the use of that approach in these tables and the document's text. However, if the RPG for these Class I areas includes Virginia emissions reductions derived from the MANE-VU

[1] *Virginia Electric and Power Company's Report of Its Integrated Resource Plan*, Dominion Energy, May 1, 2018, Page 42.

Ask as described in Section 4.2.4, the RPG should be recalculated omitting such reductions. The emission control measures listed in the MANE-VU Ask are currently not federally enforceable in Virginia. At this time, whether or not these control measures or other control measures will be included in Virginia's SIP is unclear since DEQ has not finalized its screening methodology or notified facilities of the need to submit a four-factor analysis. Further, some of the listed control measures are unlikely to be included in Virginia's Regional Haze SIP. For example, currently DEQ has no plans to pursue sulfur content limitations in fuel oil for a number of reasons, some of which are supplied in the Virginia October 21, 2019, comment letter to New Jersey on that state's Regional Haze SIP proposal.

Federal regulations and EPA guidance support the use of federally enforceable limitations within the long term strategy. 40 CFR Part 51.308(f)(2) notes:

> *Long-term strategy for regional haze.* Each State must submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I Federal area within the State and for each mandatory Class I Federal area located outside the state that may be affected by emissions from the State. The long-term strategy must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress, …

The EPA guidance discusses this issue under footnote 80 on page 46:

> …If another contributing state has not yet even determined the measures that are necessary to make reasonable progress at the jointly affected Class I area, then the state with the Class I area must set the PRGs based on whatever measures that the contributing state has actually adopted to meet the requirements for the first implementation period and other CAA requirements. The state with the Class I area may not base its RPS on speculation about what another state will do. …

Therefore, DEQ recommends that the RPG for these Class I areas rely on a platform that considers only reductions from on-the-books and on-the-way federally enforceable measures. Otherwise, the RPG selected by New Hampshire will be inconsistent with federal regulation and guidance since the projected value is based on speculative emission reductions that are not enforceable.

Again, thank you for this opportunity to comment.

Sincerely,

Thomas R. Ballou
Director, Air Data Analysis and Planning

TRB/dam

cc: Ms. Susan Spielburger, U.S. EPA
Mr. John Hornback, Metro-4/SESARM

west virginia department of environmental protection

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Austin Caperton, Cabinet Secretary
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December 18, 2019

Craig Wright, Director
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Via electronic submittal to: Felice.Janelle@des.nh.gov, Catherine.Beahm@des.nh.gov

Re: West Virginia Comments on the New Hampshire Regional Haze Plan Periodic Comprehensive Revision

Dear Director Wright:

The West Virginia Division of Air Quality (WVDAQ) appreciates the opportunity to provide comments on the New Hampshire Department of Environmental Service's (NHDES) proposed *New Hampshire Regional Haze Plan Periodic Comprehensive Revision* (proposed NHSIP), published for public comment on October 31, 2019. The purpose of the proposed NHSIP is to establish a Reasonable Progress Goal (RPG) for the second planning period (2018-2028) to achieve the objective of reaching natural background visibility levels by the year 2064 at the two federally designated Class I areas within New Hampshire, Great Gulf (GRGU) and Presidential Range – Dry River Wilderness Area (PRRA), and other nearby Class I areas impacted by emissions from New Hampshire sources of air pollution. The proposed NHSIP also addresses other mandatory SIP requirements for regional haze, including:

A. Establishment of baseline, current, and natural visibility conditions for the 20% most impaired days and the 20% clearest days at GRGU and PRRA.
B. Identification of New Hampshire's long-term strategy to address regional haze for GRGU and PRRA as well as other Federal Class I areas outside New Hampshire.
C. Establishment of the 2028 RPG for GRGU and PRRA and meet the Uniform Rate of Progress (URP) requirement.
D. An assessment of the current monitoring strategy.

This letter will focus on the requirements that would affect West Virginia as the proposed NHSIP is currently written, particularly requirement B. For requirement B, the NHDES in Section 3.2.1 of the proposed NHSIP identified West Virginia as an upwind state that contributes to

visibility impairment at GRGU and PRRA[1]. Further, New Hampshire sought to identify sources in upwind states which impact visibility at GRGU and PRRA and suggests controls or other measures in the form of "Asks," including five specified as well as various general sources in West Virginia[2]. WVDAQ does not agree with this assessment nor with many of the methods employed by the NHDES within the proposed NHSIP and contends the proposal should be updated to address these objections.

The Mid-Atlantic/Northeast Visibility Union (MANE-VU) regional planning organization (RPO), of which New Hampshire is a member state, developed its projected visibility impairments for intra-RPO and nearby Class I areas via a combination of estimated emissions from upwind sources divided by the distance to the area (Q/d), the utilization of the California Puff Model (CALPUFF) Long Range Transport (LRT) model to calculate impacts from upwind sources, and Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) back trajectories. WVDAQ contends these methods are not the most technically valid for such estimations. First, MANE-VU utilized actual 2015 emissions data for electric generating units (EGUs) and actual 2011 emissions data for non-EGU sources. A more accurate estimation would utilize projected 2028 source emissions within the model runs, which is the current recommendation by USEPA[3]. Second, CALPUFF has never been the USEPA preferred model for long-range impact estimations greater than 300 kilometers, as beyond this range the model tends to overestimate pollutant concentrations at receptor sites and skew calculated impacts higher than can be reasonable anticipated[4]. The USEPA removed CALPUFF as a preferred Appendix A model for LRT beyond 50 kilometers in the 2017 revision of Appendix W of Part 51[5]. The agency had previously determined via tracer studies "…the CALPUFF dispersion model had performed in a reasonable manner, and had no apparent bias toward over or under prediction, so long as the transport distance was limited to less than 300km."[6] It should be noted that MANE-VU has a history of using the CALPUFF model at ranges longer than recommended, as it did during the first round of regional haze SIPs, even after being reminded of this error. Interestingly, the closest physical location in West Virginia to PRRA is more than 740 kilometers and even further for GRGU, which calls into question any modeling performed with CALPUFF demonstrating visibility impairment from any sources within the state. HYSPLIT also has some limitations, including failure to incorporate chemical reactions and depositions between the emission point and the receptor site[7].

In Section 4.2.4 of the proposed NHSIP, the NHDES listed five Asks for listed upwind states in item B above[8]. These Asks were developed by MANE-VU and are directed at MANE-VU states (Intra-Asks) as well as non-MANE-VU states (Inter-Asks). The Inter-Asks include:

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[1] *New Hampshire Department of Environmental Services Regional Haze Plan – Periodic Comprehensive Revision*, October 31, 2019, p. 27

[2] *New Hampshire Department of Environmental Services Regional Haze Plan – Periodic Comprehensive Revision*, October 31, 2019: pp. 40-42, Table 4-7; pp.46-47, Table 4-9

[3] *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*, EPA-457/B-19-003, August 2019, p. 17

[4] *Documentation of the Evaluation of CALPUFF and Other Long Range Transport Models Using Tracer Field Experiment Date*, p. 141 (https://www3.epa.gov/scram001/reports/EPA-454_R-12-003.pdf)

[5] 82 FR 5182-5235 (https://www.govinfo.gov/content/pkg/FR-2017-01-17/pdf/2016-31747.pdf)

[6] 70 FR 68218-68261 (https://www.govinfo.gov/content/pkg/FR-2005-11-09/pdf/05-21627.pdf)

[7] HYSPLIT Limitations (https://ready.arl.noaa.gov/hypub/limitations.html)

[8] *New Hampshire Department of Environmental Services Regional Haze Plan – Periodic Comprehensive Revision*, October 31, 2019, pp. 45-47

1. *Electric Generating Units (EGUs) with a nameplate capacity larger than or equal to 25MW with already installed NO_x and/or SO_2 controls - ensure the most effective use of control technologies on a year-round basis to consistently minimize emissions of haze precursors, or obtain equivalent alternative emission reductions;*
2. *Emission sources modeled by MANE-VU that have the potential for 3.0 Mm^{-1} or greater visibility impacts at any MANE-VU Class I area, as identified by MANE-VU contribution analyses ... – perform a four-factor analysis for reasonable installation or upgrade to emission controls* [see table 4-9 in proposed NHSIP];
3. *States should pursue an ultra-low sulfur fuel oil standard similar to the one adopted by the MANE-VU States in 2007 as expeditiously as possible and before 2028, depending on supply availability, where the standards are as follows:*
    a. *distillate oil to 0.0015% sulfur by weight (15 ppm)*
    b. *#4 residual oil within a range of 0.25 to 0.5% sulfur by weight*
    c. *#6 residual oil within a range of 0.3 to 0.5% sulfur by weight.*
4. *EGUs and other large point emission sources greater than 250 MMBtu per hour heat input that have switched operations to lower emitting fuels – pursue updating permits, enforceable agreements, and/or rules to lock-in lower emission rates for SO_2, NO_x and particulate matter (PM). The permit, enforcement agreement, and/or rule can allow for suspension of the lower emission rate during natural gas curtailment.*
5. *Each State should consider and report in their SIP measures or programs to: a) decrease energy demand through the use of energy efficiency, and b) increase the use within their state of Combined Heat and Power (CHP) and other clean Distributed Generation technologies including fuel cells, wind, and solar.*

These Inter-Asks are discussed individually below.

Inter-Ask One: Electric Generating Units (EGUs) with a nameplate capacity larger than or equal to 25MW with already installed NO_x and/or SO_2 controls - ensure the most effective use of control technologies on a year-round basis to consistently minimize emissions of haze precursors, or obtain equivalent alternative emission reductions. MANE-VU and the proposed NHSIP have identified SO_2 and NO_x as the primary drivers of visibility impairments at Class I areas within the MANE-VU area[9]. This is an accurate assessment and these two pollutants should be properly addressed, particularly SO_2[10]. West Virginia has coal fired and natural gas fired EGUs, both of which emit these two pollutants to the atmosphere. However, all permitted and operating coal fired EGUs within West Virginia with nameplate capacity greater than 25 MW are equipped with NO_x and SO_2 controls which are required by their respective federally enforceable Title V Operating Permits to be operated year-round. Likewise, all West Virginia natural gas-fired EGUs of this size or larger are controlled for NO_x with limits contained within federally enforceable Title V Operating Permits; SO_2 emissions from pipeline quality natural gas-fired units are negligible in comparison to their coal fired counterparts. This includes the EGU's the NHDES listed within Table 2-2 of the proposed NHSIP, including the two listed units at Harrison Power Station (Harrison). The two units at Harrison are equipped with Selective Catalytic Reduction (SCR) for

[9] *New Hampshire Department of Environmental Services Regional Haze Plan – Periodic Comprehensive Revision,* October 31, 2019, p. 13
[10] Camnet (https://hazecam.net/poor-vis.aspx)

NO_x and with Flue Gas Desulfurization (FGD, or scrubbers) for SO_2 control. These controls are typically in excess of 95% efficient and considered to be Best Available Retrofit Technology (BART) for these two pollutants. These controls are already in place to meet previous Clean Air Act (CAA) requirements, and they significantly reduce visibility impairing air pollution. As such, additional controls at Harrison would be extremely high cost with little benefit and are therefore not reasonable[11]. Additionally, Harrison Power Station is subject to a federally enforceable permit regarding NO_x emissions, which sets the emission limit at 0.2 pounds NO_x per MMBTU heat input during ozone season and at 0.25 pounds NO_x per MMBTU heat input during non-ozone season. Further, the facility is also subject to the Cross-State Air Pollution Rule (CSAPR) and does not have as many SO_2 allowances as in previous years. Also listed within Table 2-2 of the proposed NHSIP is the Kammer Power Station (Kammer) which was completely and permanently retired on June 1, 2015. MANE-VU is already aware of the Kammer retirement[12].

Inter-Ask Two: Emission sources modeled by MANE-VU that have the potential for 3.0 Mm^{-1} or greater visibility impacts at any MANE-VU Class I area, as identified by MANE-VU contribution analyses ... – perform a four-factor analysis for reasonable installation or upgrade to emission controls. Table 4-2 of the proposed NHSIP lists five EGUs at two facilities in West Virginia as requiring four-factor analysis for reasonable installation of upgrades to emission controls. These are Harrison Units 1 and 2 and Kammer Units 1, 2 and 3. As stated above in the response to Inter-Ask One, all Harrison EGUs are controlled with BART for SO_2 and NO_x, and Kammer has been completely and permanently retired. Also as stated above, further reductions of these pollutants from the remaining units is not reasonably achievable from a cost or benefit standpoint[11].

Inter-Ask Three: States should pursue an ultra-low sulfur fuel oil standard similar to the one adopted by the MANE-VU States in 2007 as expeditiously as possible and before 2028, depending on supply availability, where the standards are as follows... [see Inter-Ask Three details above]. Residual oil sales in West Virginia for 2017 were zero[13], and there are no known uses of this fuel at stationary sources within the state. Nationally, most residual oil sales are used in the transportation sector[14], almost exclusively by very large marine vessels[15], of which there are none in land-locked West Virginia. Distillate oil sales within West Virginia have been relatively steady from 2012 through 2017, the last year for which sales data are available[16]. However, this sum includes on-road and off-road diesel fuel, which have recently transitioned to ultralow-sulfur blends of 15 parts per million (ppm) or less as required by federal law[17]. Residential home heating oil use in West Virginia was never considerable and this small number has been in decline for

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[11] *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*, EPA-457/B-19-003, August 2019, pp. 22-23

[12] OTC/MANE-VU 2011 Based Modeling Platform Support Document – October 2018 Update, p. 9-84 (https://otcair.org/MANEVU/Upload/Publication/Reports/OTC%20MANE-VU%202011%20Based%20Modeling%20Platform%20Support%20Document%20October%202018%20-%20Final.pdf)

[13] US Energy Information Administration (https://www.eia.gov/dnav/pet/pet_cons_821rsd_a_EPPR_VTE_Mgal_a.htm)

[14] US Energy Information Administration (https://www.eia.gov/todayinenergy/detail.php?id=4250)

[15] US Energy Information Administration (https://www.eia.gov/dnav/pet/pet_cons_821rsd_dcu_nus_a.htm)

[16] Energy Information Administration (https://www.eia.gov/dnav/pet/pet_cons_821use_a_EPD0_VRS_Mgal_a.htm)

[17] Diesel Fuel Standards and Rulemakings (https://www.epa.gov/diesel-fuel-standards/diesel-fuel-standards-and-rulemakings)

decades, as most homes that once used this fuel have transitioned to cheaper, more convenient, and cleaner natural gas or electricity; in fact, less than 3% of homes in West Virginia are heated with residential oil[18]. United States Energy Information Agency (EIA) data for 2017 states that 85% of residential heating oil sales for the entire United States were within the MANE-VU RPO[19]. As such, it is completely reasonable for New Hampshire to establish an Intra-Ask of its sister MANE-VU states to restrict sulfur content in residential oil sales. However, to extend this to an Inter-Ask of upwind non-MANE-VU states is non-productive. It should also be noted that residential heating oil sold in the West Virginia market is extremely likely to be sourced from the same suppliers which market it in the MANE-VU RPO, because of the proximity of the much smaller West Virginia market to the much larger MANE-VU market. Heating oil sold in the MANE-VU market is already nearly all ultra-low sulfur fuel[20].

Inter-Ask Four: EGUs and other large point emission sources greater than 250 MMBtu per hour heat input that have switched operations to lower emitting fuels – pursue updating permits, enforceable agreements, and/or rules to lock-in lower emission rates for SO_2, NO_x and particulate matter (PM). The permit, enforcement agreement, and/or rule can allow for suspension of the lower emission rate during natural gas curtailment. As stated above, all coal fired EGUs operating within West Virginia with nameplate capacity greater than 25 MW are equipped with NO_x and SO_2 controls which are required to be operated year-round by their respective federally enforceable Title V Operating Permits; likewise these units are all equipped with PM controls that are also federally enforceable permit-required to be operated year-round. West Virginia natural gas-fired EGUs of this size or larger are equipped with NO_x controls and are subject to federally enforceable Title V Permits limiting NO_x emissions, and these units have negligible SO_2 emissions as they are all fired on pipeline-quality natural gas. Table 4-7 of the proposed NHSIP lists industrial sources with an SO_2 visibility impact on Class I areas. This list was compiled with 2011 emissions data and as such is significantly outdated. Three facilities within West Virginia were listed, and only one of those currently operates coal-fired boilers: Dupont Washington Works; these boilers are now split from Dupont and are part of a newly formed adjacent facility renamed Chemours. The Chemours facility is currently under a consent order with the WVDAQ to replace the coal fired boilers with low-NO_x natural gas-fired units by December 2021. Construction of this project is already well under way with an anticipated switchover date ahead of the required timeline. Likewise, in 2011 Bayer CropScience operated three coal-fired boilers; however, these units have been dismantled and replaced with two low-NO_x natural gas-fired units. Capital Cement–ESSROC Martinsburg is a large Portland cement manufacturing facility which uses coal to calcine cement from limestone. The kilns were replaced in 2009 and SO_2 emissions subsequently decreased. However, it should be noted that SO_2 emissions from cement kilns are inherently mitigated by the alkaline nature of the final product, which typically absorbs between 70% and 95% of the SO_2 generated from the burning of the fuel and liberated from pyrite pockets within the raw limestone feedstock[21].

Inter-Ask Five: Each State should consider and report in their SIP measures or programs to: a) decrease energy demand through the use of energy efficiency, and b) increase the use within their

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[18] Energy Information Administration (https://www.eia.gov/state/print.php?sid=WV)
[19] US Energy Information Administration (https://www.eia.gov/energyexplained/heating-oil/use-of-heating-oil.php)
[20] US Energy Information Administration (https://www.eia.gov/todayinenergy/detail.php?id=5890)
[21] USEPA AP-42 (https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s06.pdf, p. 11.6-6)

state of Combined Heat and Power (CHP) and other clean Distributed Generation technologies including fuel cells, wind, and solar. This is a quite noble plan which MANE-VU and New Hampshire have established for other states. It is beyond the scope of regional haze SIP development to suggest such fundamental changes to the energy market, especially in other jurisdictions without prior discussion. The USEPA currently has in place multiple national standards and programs that encourage energy efficiency. These programs are already applicable and available to every state and region listed within the proposed NHSIP[22]. Many electric utilities also administer their own efficiency programs in the form of rebates for customers[23], and the Internal Revenue Service (IRS) has historically offered multiple tax credit incentives for the adoption of energy efficient measures[24].

Additionally, MANE-VU and New Hampshire failed to consult with jurisdictions outside MANE-VU when developing the Inter-Asks. Section 51.308(f)(2) of the Regional Haze Rule requires SIPs to include "…enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress as determined pursuant to (f)(2)(i) through (iv)." Further, section 51.308(f)(2)(ii)(A) of the Regional Haze Rule states "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." New Hampshire has neglected to consult with other states outside MANE-VU concerning this critical requirement when developing the proposed NHSIP, and as such each of the five Inter-Asks are invalid outside the MANE-VU RPO. These MANE-VU Inter-RPO Asks should be removed from the proposed NHSIP until such agreements have been secured with the named upwind states.

Further, Figure 1-6 of the proposed NHSIP illustrates the current trend of visibility impairment for the 20% most impaired days at GRGU to be well below the URP[25]. This is primarily a result of already reduced SO_2 and NO_x emissions from upwind EGUs, reduced NO_x emissions from nearby mobile sources, and reduced SO_2 emissions from fuel oil combustion sources since the first round of regional haze SIPs was completed over ten years ago. West Virginia appreciates New Hampshire's aggressive goal to be ahead of the URP, but it stresses the current path appears to be more than adequate without demanding unrealistic and unnegotiated goals of upwind jurisdictions.

Visibility Improvement – State and Tribal Association of the Southeast (VISTAS) has completed more accurate preliminary modeling utilizing Particulate Matter Source Apportionment Technology (PSAT). These model runs utilized projected total state-wide anthropogenic and natural 2028 emissions of NO_x and SO_2 as inputs. Initial model results suggest much lower visibility impairment impacts on GRGU and PRRA than those modeled by MANE-VU (see attachment 1). Total West Virginia contribution for combined SO_2 and NO_x visibility impairment for the 20% most impaired days was modeled to be 0.188 Mm^{-1} and for the 20% best days was

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[22] USEPA Energy and the Environment (https://www.epa.gov/energy/clean-energy-programs)
[23] Database of State Incentives for Renewables & Efficiency (https://www.dsireusa.org/)
[24] Energy Incentives for Individuals: Residential Property Updated Questions and Answers (https://www.irs.gov/newsroom/energy-incentives-for-individuals-residential-property-updated-questions-and-answers)
[25] *New Hampshire Department of Environmental Services Regional Haze Plan – Periodic Comprehensive Revision*, October 31, 2019, p. 10

modeled to be 0.004 Mm^{-1}. This is significantly below the 2.0 Mm^{-1} contribution threshold MANE-VU and the proposed NHSIP set for identifying upwind states reasonably expected to contribute to visibility impairment in MANE-VU Class I areas[26]. This graphic demonstrates the impacts from the MANE-VU and Lake Michigan Air Directors Consortium (LADCO) RPO regions are expected to be considerably more significant when compared to the VISTAS region, which sums to 4.422 Mm^{-1} for the 20% most impaired days and to 0.083 Mm^{-1} for the 20% best days. Based on these preliminary model runs and the MANE-VU threshold for inclusion, West Virginia as well as the other VISTAS members should be completely excluded from the proposed NHSIP.

Finally, the WVDAQ does not have the authority to make unauthorized commitments within SIPs, either within or outside its jurisdictional boundaries. The WVDAQ must first draft and then the West Virginia Legislature must approve a rule prior to inclusion in a SIP. Final determinations of SIP completeness rests with the USEPA. Neither West Virginia nor any other jurisdiction is obligated to comply with the unnegotiated Inter-Asks within the proposed NHSIP. For the reasons outlined in this letter, West Virginia respectfully asks that New Hampshire remove it from the list of states considered to be reasonable contributing to visibility impairment at GRGU and PRRA.

Again, the WVDAQ appreciates the opportunity to comment on the NHDES's *New Hampshire Regional Haze Plan Periodic Comprehensive Revision*, for the second implementation period from 2018 to 2028.

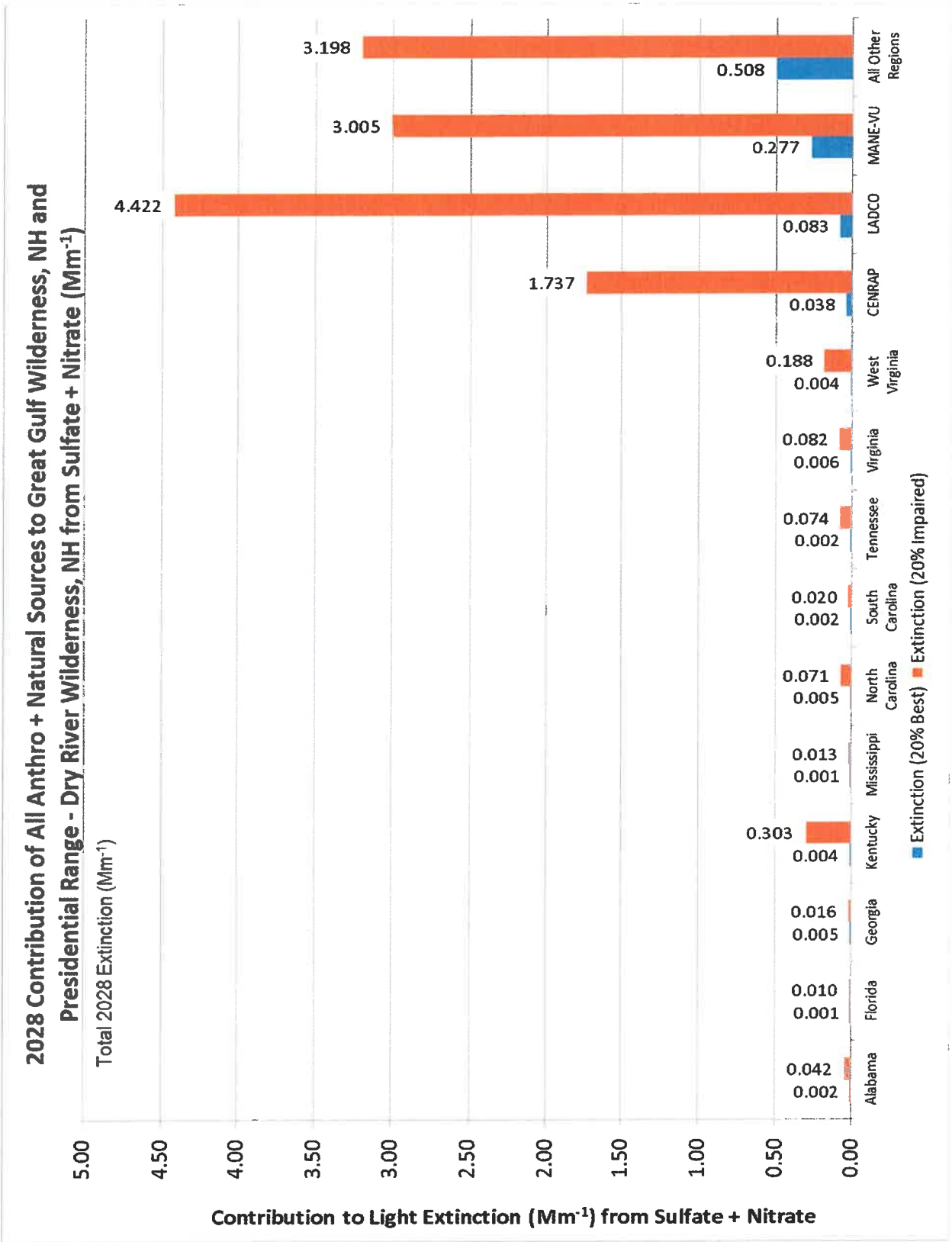
Sincerely,

Laura M. Crowder
Director
WV Division of Air Quality

cc: Ms. Susan Spielberger, USEPA Region 3
Mr. John Hornback, SESARM

[26] *New Hampshire Department of Environmental Services Regional Haze Plan – Periodic Comprehensive Revision*, October 31, 2019, p. 27

Attachment 1: VISTAS modeled impairment for GRGU and PRRA using total 2028 projected emissions data from all SO_2 and NO_x sources within the referenced area.



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December 30, 2019

Via Electronic Mail to craig.wright@des.nh.gov, catherine.beahm@des.nh.gov, and felice.janelle@des.nh.gov.

Re: Comments on New Hampshire's Regional Haze Plan Periodic Comprehensive Revision

Dear Director Craig A. Wright,

Sierra Club and the National Parks Conservation Association submit these comments addressing in part Department of Environmental Services' ("DES") draft Regional Haze Plan Periodic Comprehensive Revision (the "Draft Revision"). As discussed in more detail below, the Draft Revision's proposed reliance on the reasonably available control technology ("RACT") determination for NOx emission limits for Schiller Station is flawed and improper, both becausethe 0.25 lbs NOx/MMbtu limit is inconsistent with RACT, and because the coal-fired units at Schiller Station have demonstrably achieved far lower NOx emission rates in actual practice. Use of the 0.25 lbs NOx/MMbtu limit is thus legally insupportable and threatens to impede if not reverse progress in improving visibility in New Hampshire's Class I areas.

Background on RACT

RACT determinations and RACT-based emission limits are required by the Clean Air Act for areas failing to attain National Ambient Air Quality Standards ("NAAQS"). *See* 42 U.S.C. § 7502(c)(1). RACT is a technology-forcing standard intended to ensure that polluting sources are controlled consistent with available methods for reducing pollution. As a result, RACT is a stringent standard, designed to induce and require improvements in control technology and reductions in pollutant emissions. Indeed, EPA has long maintained that "RACT should represent the toughest level of control considering technological and economic feasibility

that can be applied to a specific situation" and that "[a]nything less than this is by definition less than RACT."[1]

RACT is defined as "the lowest emissions limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[2] The RACT definition comprises two parts: (a) technological feasibility and (b) economic feasibility.

(a) Technological Feasibility

"The technological feasibility of applying an emission reduction method to a particular source should consider the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements."[3]

(b) Economic Feasibility

As EPA has explained, "[e]conomic feasibility considers the cost of reducing emissions and the difference in costs between the particular source and other similar sources that have implemented emission reduction."[4] Specifically,

> EPA presumes that it is reasonable for similar sources to bear similar costs of emission reductions. **Economic feasibility rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources. Less efficient sources would be rewarded by having to bear lower emission reduction costs if affordability were given high consideration. Rather, economic feasibility for RACT purposes is largely determined by evidence that other sources in a source category have in fact applied the control technology in question.**[5]

Further, EPA has explained that RACT is not intended to enshrine existing control methods, but rather is technology-forcing.[6] Thus, "[i]n determining RACT for an individual source or group of sources, the control agency, using the available guidance, should select the

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[1] Memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management, U.S. EPA, to Regional Administrators, Regions I - X (Dec. 9, 1976), at 2 (hereinafter "Strelow Memo"), *available at* https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/19761209_strelow_ract.pdf.

[2] State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 55,620, 55,624/3 (Nov. 25, 1992); *see also Navistar Int'l Transp. Corp. v. United States EPA*, 941 F.2d 1339, 1343 (6th Cir. 1991) ("Since 1976, the EPA has interpreted reasonably available control technology to be the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.") (quotations omitted).

[3] U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental, 57 Fed. Reg. 18,070, 18,074 (Apr. 28, 1992).

[4] 57 Fed. Reg. at 18,074.

[5] 57 Fed. Reg. at 18,074 (emphasis added).

[6] Strelow Memo at 2.

best available controls, deviating from those controls only where local conditions are such that they cannot be applied there and imposing even tougher controls where conditions allow."[7]

Substantive Comments

A. Schiller Station's NOx Limits Fail to Comport with RACT Requirements, and Cannot Be Relied on For New Hampshire's Regional Haze Obligations

Schiller Station is equipped with SNCR controls for NOx reduction and is capable of complying with emission limits far lower than the 0.25 lbs/MMbtu contemplated in the Draft Revision. *See* Draft Revision at 55-56. The RACT determination that DES relies on in the Draft Revision, however, argues that actually *using* those controls is somehow technologically infeasible, despite Schiller Station's long history of using the controls for over 20 years since their installation date in 1999.

Numerous coal-fired power plants (including Schiller Station) are perfectly able to operate SNCR technology, and to thereby achieve much lower emission rates than the 0.25 lbs/MMbtu rate in the Proposed Order. For example, the Huntley and Dunkirk coal-fired power plants in New York are SNCR-equipped, and consistently emit NOx at roughly 0.10 lbs/MMbtu; indeed, the NOx RACT limit applicable to those plants is 0.12 lbs/MMbtu—less than half of the 0.25 lbs/MMbtu rate in the Proposal.

In face of this, DES's NOx limit for Schiller's coal-fired units appears to be based on emissions data from over a decade ago in 2007, and an assertion that Schiller is not only incapable of achieving lower emission rates than those of 2007, but that it is unlikely to be able to achieve even those rates *now*. However, when PSNH was operating Schiller Station in 2007, it was not *trying* to achieve lower emission rates—the governing NOx emission limit at the time was 0.50 lbs/MMbtu. Schiller Station's performance under PSNH (when it nonetheless achieved average emission rates of less than 0.20 lbs/MMbtu) does not demonstrate a floor on proper emission rates, and instead is only evidence that Schiller Station is quite capable of reducing NOx emissions well below the governing standard when it runs its SNCR.

Nonetheless, the Draft Revision claims that Schiller Station is technologically incapable of achieving any emission rate lower than 0.25 lbs/MMbtu, based on claims Granite Shore Power ("GSP") made in applying for the RACT Revision. However, most of GSP's arguments appear to center around its claim that the current reagent storage tanks at Schiller Station are possibly too small to accommodate actually using the reagent on a consistent basis. *See, e.g.*, RACT Application at 7 (SNCR operation at Schiller depends on "capacity of reagent storage and delivery system"); *id.* ("current consumption for SR5 is . . . higher than the consumption rate

[7] *Id.*

considered . . . when the reagent storage tank was designed and ***could*** negatively impact the total system capacity if GSP was forced to operate SNCR at maximum rates for SR4 and SR6") (emphasis added); *id.* at 9 ("it is ***unknown*** if supply issues will arise as the system was initially designed with an already low 6-day storage capacity") (emphasis added). Yet at no point does GSP bother discussing getting newer, larger tanks, or merely supplementing the tanks, or even determining whether the present tanks actually do constrain SNCR operation; instead, GSP treats the current tank size as a presumptive and intractable limitation on the system. Expanding reagent tank capacity is, of course, not only entirely feasible technologically, it is extremely cheap, and could enable further NOx emission reductions necessary to meet New Hampshire's Haze obligations.

Likewise, nothing indicates that lower NOx emission rates from Schiller Station's coal-fired units would be economically infeasible. Indeed, the limited analysis GSP provided in its RACT revision application shows that such rates are entirely economically feasible, for two reasons.

First, GSP's cost-efficacy calculations hinge primarily on incorrect approaches: using significantly higher-than-actual wholesale electricity prices for its "lost revenue" calculations, and only analyzing a reduction in emissions from 0.29 to 0.25 lbs/MMbtu. GSP's application materials assume that the revenue forgone through generation losses when its SNCR is operated would be at $60 per megawatt-hour in its ~88% capacity factor scenario analysis and a whopping $80 per megawatt-hour in its ~25% capacity factor scenario analysis. These price points wildly overstate actual wholesale prices: less than $34 per megawatt-hour.[8] GSP's application also fails to analyze any scenario other than an emissions reduction from 0.29 to 0.25 lbs/MMbtu. (GSP should have looked at greater emissions reductions, including, for example, decreases to 0.20 and 0.15 lbs/MMbtu, like NH DES had requested.[9]) GSP should have also looked at reductions from a higher baseline. Given in particular that GSP claims repeatedly that the SNCR controls at Schiller were designed to achieve a 0.33 lbs/MMbtu NOx emission rate, GSP's assertion of baseline emission rate *when the controls are not employed* of 0.29 lbs/MMbtu is unsupported.

Tables 1 and 2 below include additional calculations using GSP's assumptions and figures, with the $34 per megawatt-hour price used in place of GSP's inflated prices, and

[8] *See, e.g.*, ISO New England Press Release "New England's Wholesale Electricity Prices in 2017 Were the Second-Lowest Since 2003," *available at* https://www.iso-ne.com/static-assets/documents/2018/03/20180306_pr_2017prices.pdf. A copy is attached hereto as Exhibit 2.

[9] *See* Application at 2 (noting that NH DES had requested an analysis of "economic feasibility of operating the SNCR systems on a year-round basis" to achieve "a NOx emission level of 0.15 lbs/MMbtu" and "a NOx emission level of 0.20 lbs/MMbtu"). The Proposed Order's contemplated reliance on an analysis from GSP *that failed to provide even the information NH DES requested* is arbitrary and capricious.

examining different emission rates in keeping with NH DES's directive.[10] This analysis shows that, rather than the $8,409 per ton and $10,113 per ton costs GSP asserts, reduction costs are far lower—at least as low as in the ~$3000 per ton range.

Table 1: Corrected Scenario 1

Scenario 1 -88% Capacity Factor

	.29-.25	.35-.25	.35-.20	.35-.15	.29-.20	.29-.15
Rate Difference Points	0.4	1	1.5	2	0.9	1.4
Reagent	195,072	487,680	731,520	975,360	438,912	682,752
Dilution Water	18,481	46,203	69,304	92,405	41,582	64,684
Lost Revenue	261,120	261,120	261,120	261,120	261,120	261,120
Maintenance	16,233	16,233	16,233	16,233	16,233	16,233
Annual Electricity	4,218	4,218	4,218	4,218	4,218	4,218
Administrative Charges	487	487	487	487	487	487
Air Heater Cleaning	46,080	46,080	46,080	46,080	46,080	46,080
Total Cost	541,691	862,021	1,128,962	1,395,903	808,632	1,075,574
Nox removed	88	220	330	440	198	308
$/ton	**$ 6,156**	**$ 3,918**	**$ 3,421**	**$ 3,173**	**$ 4,084**	**$ 3,492**

Table 2: Corrected Scenario 2

Scenario 2 - 25% Capacity Factor

	.29-.25	.35-.25	.35-.20	.35-.15	.29-.20	.29-.15
Rate Difference Points	0.4	1	1.5	2	0.9	1.4
Reagent	54,864	137,160	205,740	274,320	123,444	192,024
Dilution Water	5,198	12,995	19,493	25,990	11,696	18,193
Lost Revenue	73,440	73,440	73,440	73,440	73,440	73,440
Maintenance	16,233	16,233	16,233	16,233	16,233	16,233
Annual Electricity	1,186	1,186	1,186	1,186	1,186	1,186
Administrative Charges	487	487	487	487	487	487
Air Heater Cleaning	-	-	-	-	-	-
Total Cost	151,408	241,501	316,579	391,656	226,486	301,563
Nox removed	25	62.5	93.75	125	56.25	87.5
$/ton	**$ 6,056**	**$ 3,864**	**$ 3,377**	**$ 3,133**	**$ 4,026**	**$ 3,446**

Second, both these per ton costs *and* the significantly higher ones flowing from GSP's flawed and incomplete analysis are entirely in-line with RACT for NOx. Other states in New England employ cost thresholds consistent with the costs per ton in Tables 1 and 2 being

[10] Reagent and dilution water costs are also scaled to reflect greater use of the SNCR controls. An Excel spreadsheet with the calculations is attached hereto as Exhibit 3.

presumptively RACT. For example, Connecticut's RACT regulations provided the following for case-by-case RACT demonstrations:

> (h) **Case-by-case RACT demonstration.**
>
> (1) An owner or operator may request the commissioner's approval for a case-by-case emissions limitation for an emission unit if the owner or operator demonstrates to the commissioner's satisfaction that an emissions limitation of subsection (d) of this section is not economically or technically feasible for the emission unit. In such a request for a case-by-case RACT determination, the owner or operator shall:
>
> (A) Demonstrate that:
>
> (i) The use of available emissions control technology is either technologically or economically infeasible for the emission unit that is the subject of the demonstration,
>
> (ii) Each compliance option designated in subsection (g) of this section is either technologically or economically infeasible for the emission unit that is the subject of the demonstration, and
>
> (iii) For the purposes of this subsection, economic feasibility is determined on a dollar/ton basis, where ***any value determined using a method approved by the commissioner that is equal to or less than $13,118/ton NOx reduced for a Phase 1 demonstration or $13,635/ton NOx reduced for a Phase 2 demonstration is presumed economically feasible***;

Connecticut R.C.S.A. 22a-174-22e(h)(1) (emphasis added).[11] Plainly, the cost-per-ton of NOx reductions for Schiller Station—even the inflated numbers provided by GSP—are well-within the range of RACT. The Draft Revision's election to reject lower NOx emission rate requirements for Schiller and to instead rely on the flawed prior RACT determination is thus arbitrary and capricious.

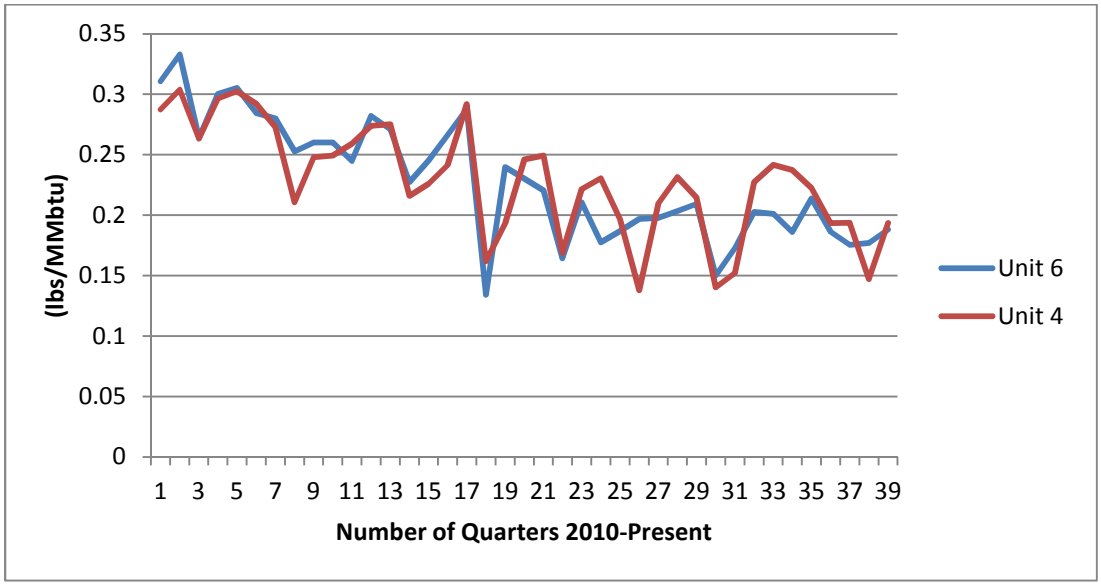
B. <u>Actual Emission Rates at Schiller Station Are Below the Draft Revision Limit</u>

Not only are the proposed emission limits for Schiller Station under the Draft Revision inconsistent with RACT requirements, but they are also significantly above the actual NOx emission rates for the Schiller coal-fired units. As a result, the 0.25 lbs/MMbtu NOx limit would allow for significant increases in emissions from Schiller, threatening further progress towards resolving visibility problems.

As Figure 1 demonstrates, both Schiller coal-fired units have recently averaged NOx emission rates well-below 0.25 lbs/MMbtu.

[11] *Available at* https://eregulations.ct.gov/eRegsPortal/Browse/RCSA?id=Title%2022a%7C22a-174%7C22a-174-22e%7C22a-174-22e.

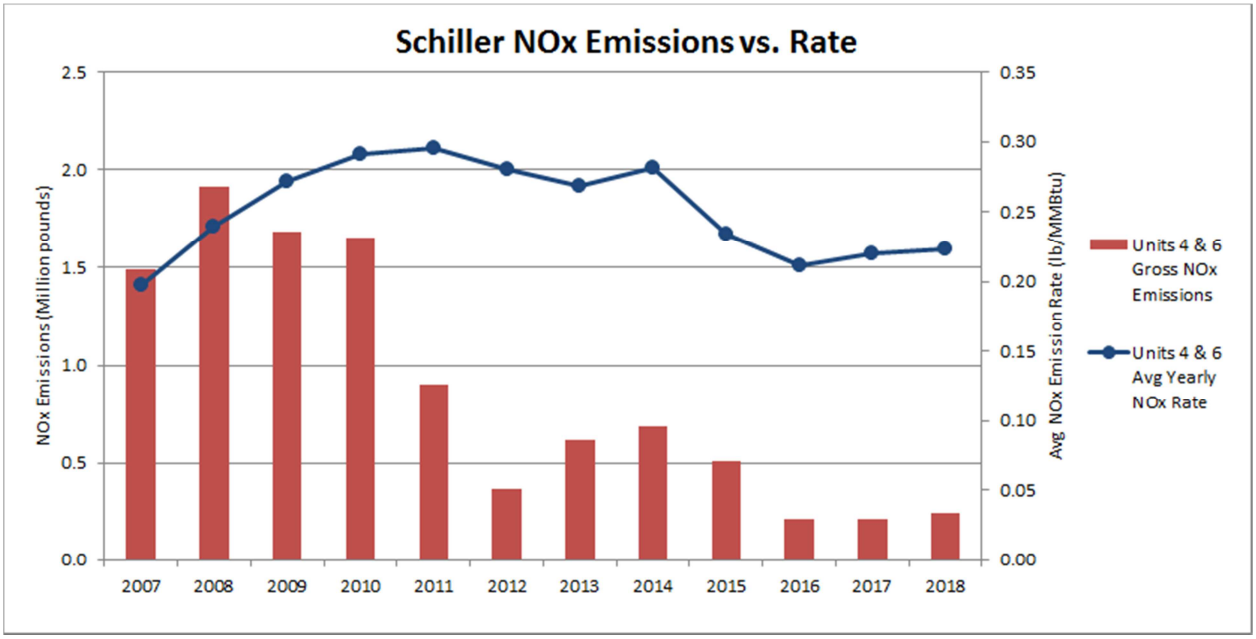
Figure 1: Quarterly NOx Emission Rates at Schiller Units 4&6, 2010-Present[12]



In fact, for the past four quarters, both units have had emission rates below 0.20 lbs/MMbtu (or 20% below the contemplated limit) and both units have in the past decade achieved multiple quarters with emission rates below 0.15 lbs/MMbtu (fully 40% below the contemplated limit). What this means is that Schiller could increase its NOx emission rates quite dramatically—to the detriment of visibility in New Hampshire—while still being in compliance with the emission limit contemplated in the Draft Revision. This problem is exacerbated by the fact that the Draft Revision does not contemplate an overall mass limit for NOx emissions, and relying instead on a simple emission rate limit; increased operation at Schiller could result in further increases in the amount of NOx emitted even if Schiller were still "compliant" with the Draft Revision's proposed emission limit.

[12] Data taken from U.S. EPA Air Markets Program Data database, *at* https://ampd.epa.gov/ampd/.

Figure 2: Schiller Station NOx Emissions versus Emission Rate, 2007-2018[13]



This is particularly problematic given that so much of the visibility gains cited by DES in the Draft Revision are due to unenforceable factors, such as economic redispatch from more pollution-intensive electricity generators to cleaner sources. These gains are therefore at risk of being reversed.

> DES appears to be aware of this problem:
>
> Further, in New Hampshire and upwind states, **there has been a shift to cleaner generation** of electricity using natural gas in place of dirtier fuels such as coal or oil. **This trend is driven by economics and the availability of less expensive natural gas supplies rather than by any regulatory mechanism. It is not known if this economic situation will continue into the future** . . .

Draft Revision at 84 (emphasis added). DES then goes on to observe that other states are taking steps to ensure that these air quality gains do not disappear when economic conditions change, noting that the MANE-VU states "are pursuing . . .the enforceable 'locking-in' of the emission rates associated with the burning of cleaner fuels." *Id.* DES should take its own advice and similarly "lock-in" the lower actually demonstrated achievable NOx emissions at Schiller Station by setting a lower emission limit for the facility.

[13] Data taken from U.S. EPA Air Markets Program Data database, *at* https://ampd.epa.gov/ampd/.

Conclusion

For the foregoing reasons, the proposed 0.25 lbs/MMbtu NOx emission rate is inconsistent with the requirements of RACT. The Proposed Order should not be finalized in its present form, and instead, a significantly lower emission rate, consistent with what is achievable with reasonably available control technology at other coal-fired power plants, should be imposed. GSP's request to help recoup its purchase of Schiller Station by bypassing NOx emissions controls—controls already paid for with ratepayer money when the plant was owned by PSNH—so that it can make additional revenue through dirty power generation should not be countenanced.

Sincerely,

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