

August 22, 2016

Gina McCarthy, Administrator
United States Environmental Protection Agency
EPA Docket Center
Mailcode 28221T
1200 Pennsylvania Avenue N.W.
Washington, D.C. 20460

*Reducing Regional Haze for
Improved Visibility and Health*

Attention: Docket ID No. EPA-HQ-OAR-2016-0289

**RE: Draft Guidance on Progress Tracking Metrics, Long-term Strategies,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**

Dear Administrator McCarthy:

The Mid-Atlantic/Northeast Visibility Union (MANE-VU) appreciates the opportunity to comment on the United States Environmental Protection Agency's (EPA) "Draft Guidance on Progress Tracking Metrics, Long-term Strategies, Reasonable Progress Goals and Other Requirements for Regional Haze State Implementation Plans for the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". MANE-VU is comprised of the Mid-Atlantic and Northeast states, tribes, and federal agencies. MANE-VU coordinates regional haze planning activities to help members meet the requirements of EPA's regional haze rules and to reduce visibility impairment in Class I areas in the Northeast and Mid-Atlantic regions.

Comment 1

Deciviews are the natural logarithm of light extinction. This makes formula 5.1 on page 29 problematic and clearly leads to days with high anthropogenic impairment being unreasonably excluded from further analysis. The formula appears to be intended to exclude the days with most extreme ratio of natural to anthropogenic emissions. This results in some days with a high impact from anthropogenic emissions being eliminated from consideration. For instance in the example table below, Day C has the most impact from anthropogenic sources, but is not analyzed in favor of Day B, which has the 3rd most impact from anthropogenic sources. MANE-VU's position is that EPA guidance should select days that have a high impact from anthropogenic sources for analysis even if there are also high impacts from natural sources. It may be that during an

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analysis period, weather conditions only cause high impacts from some anthropogenic sources at a Class I area on the same days that natural source impacts are also high, for example. It is still important to analyze the impacts from those anthropogenic sources and determine whether they can reasonably be controlled. Other methods can be used to screen out natural source impacts from 4-factor analysis.

MANE-VU strongly recommends that the calculations to select days for analysis be conducted in units of light extinction. This would simplify calculations and correctly select the days with the maximum impact from anthropogenic sources. The last two columns in the following table which is based on Table 5.2 in the Draft Guidance show a corrected ordering of the sites.

	Total b_{ext}	Natural b_{ext}	Anthro. b_{ext}	dv_{Total}	Rank by dv_{Total}	$dv_{Natural}$	dv EPAIncorrectAntrho	Rank by dv EPAIncorrectAntrho	dv_{Anthro}	Rank by dv_{Anthro}
A	75	42.8	32.3	20.14903	5	14.53953	5.6095	3	11.72482	5
B	123	16	107	25.09599	4	4.700036	20.39596	1	23.70244	3
C	193.8	32.2	160.6	29.64242	3	11.69381	17.9486	2	27.76332	1
D	300	231	69	34.01197	2	31.39833	2.613648	5	19.31521	4
E	342.8	214.2	128.5	35.34562	1	30.64325	4.70237	4	25.53344	2

The only way to calculate $dv_{Anthropogenic}$ is to use the formula that involves the natural log of anthropogenic B_{ext} . MANE-VU agrees with EPA that comparing two deciview values to determine whether they differ by more than a threshold amount is a reasonable use of deciview values. However, the equation in the proposed guidance used to calculate anthropogenic impact is not mathematically correct. The result of subtracting $dv_{Natural}$ from dv_{Total} does not yield the anthropogenic impact in deciviews ($dv_{Anthropogenic}$). Rather the result is the logarithm of the ratio between natural b_{ext} and total b_{ext} , which is not necessary to compare to anything.

Comment 2

Even if EPA will be performing calculations for the new visibility statistics in the future, clarity is needed in what data are used, definitions (including equations) of all calculation steps, and data handling conventions for every step in calculating the new visibility impairment statistics. Data handling conventions in Appendix A of the Technical Support Document are inadequate and it is apparent in the supporting spreadsheet (RHR_data_file_most_impaired_000.csv) that Appendix A needs a more detailed data handling convention write-up. MANE-VU notes the following issues with the new visibility impairment statistics calculations:

- Sulfates, nitrates, organic carbon, sea salt, coarse mass and elemental carbon data and NC-II data for those parameters should have the same data handling conventions as are used in the FED database that are being used for calculating current acceptable visibility statistics. EPA used many more decimal places than are being used in the FED database.
- The Data Dictionary for EPA's spreadsheet and Chapter 5 of the draft guidance are incomplete leaving out clear definitions and formulas for many calculation steps.

Comment 3

Starting on page 33 EPA describes a recommended approach for determining extreme events. This approach does not appear to consider current research showing the impact of anthropogenic emissions on formation of secondary organic aerosols (SOA). Many Class I areas in the Eastern US have a large visibility impact from anthropogenic SOA, which is not well accounted for in the methods presented by EPA. In particular, researchers have found that SO₂ emissions, which are higher in the Eastern US, lead to increases in anthropogenic SOA¹. EPA guidance would leave it to states to figure out how to use a different method that takes anthropogenic SOA into account and this places an unfunded burden on states. In final guidance, EPA must account for anthropogenic SOA as it affects sites in the Eastern US in its assessment of natural vs. anthropogenic emissions.

Comment 4

EPA recommends basing screening work on 2028 projections rather than the base year. While MANE-VU recognizes that it is necessary to project 2028 emissions in order to establish reasonable progress targets, MANE-VU urges EPA to identify sources contributing to visibility impairment by screening data from the most current emissions data (i.e., the base year used in the regional haze SIP) for the following reasons: .

1. Estimates of future emissions are based on current actual emissions, and are not necessarily constrained by enforceable limits. Rather, they represent estimates based on growth and control factors that provide the best estimates of future emissions. If the current emissions are not considered to be “representative” or “typical,” then growth and control factors may be used to adjust estimates of future emissions without actually constraining allowable emissions.
2. Effects of current emissions on visibility in the base year and prior years are the starting point to assess whether reasonable progress is anticipated in future years. Progress will require reductions in current emissions. Therefore, it is appropriate for screening to identify which sources are now having adverse impacts on visibility and then consider what will be done in the future to reduce those impacts. Strategies to reduce emissions from current to future levels should be identified and included in the SIP.
3. All emissions inventories are characterized by some degree of uncertainty, and future inventories are much more uncertain than current inventories. As noted above, the estimate of future emissions involves assumptions about growth and control. This magnifies uncertainty already present in current emissions estimates. Emissions from EGUs are among the most important sources of visibility impacts in the eastern US. Simply considering the year-to-year changes in the US Energy Information Agency’s forecasts of future consumption of natural gas vs. oil vs. coal by EGUs gives an indication of the amount of uncertainty involved in forecasting key emissions. It would be far more reliable for states to use current emissions estimates as a basis for identifying key sources impacting visibility at Class I areas.

¹ A. G. Carlton and B. J. Turpin, “Particle Partitioning Potential of Organic Compounds Is Highest in the Eastern US and Driven by Anthropogenic Water,” *Atmospheric Chemistry and Physics* 13, no. 20 (October 17, 2013): 10203–14, doi:10.5194/acp-13-10203-2013.

Therefore, MANE-VU recommends that all screening work be completed using base year emissions. If a unit does not get screened out, but is retiring between 2011 and 2028 it can easily be described in the four-factor analysis as having no remaining useful life and no need to be reasonably controlled. By working in the base year, states can reduce the uncertainty in their screening, leading to a more thorough four-factor analysis.

Comment 5

On page 60 EPA places a significant emphasis on using single source photochemical modeling for the purpose of screening sources. While that may be a laudable goal there are thousands of EGUs and large non EGU point sources impacting Class I areas in the eastern US. Resources are simply not available to conduct such an in depth screening analysis. The options to use a much less resource-intensive Lagrangian model such as CALPUFF should be included for the purpose of screening point sources.

Comment 6

On page 72 EPA states that it “considers 80 percent to be a reasonably large fraction for this purpose in the second planning period.” To begin with, it is not clear what the 80% is based on (deciviews, light extinction, emissions). Also key sources could go unanalyzed if the threshold concerns 80% of the impact from each state rather than 80% of the total impact. Regardless, this threshold analysis would require an incredibly large amount of resources to conduct. It would be necessary to look at every point source in the Eastern US to fulfill this obligation, which if individual point source photochemical modeling is necessary would involve modeling tens of thousands of point sources.

Comment 7

Overall, the concept of the extinction budget is not clear. Both clearer definitions are needed, as well as an example of the processes one would go through to conduct an extinction budget analysis.

It appears that the extinction budget is based on the subtraction of deciviews, which poses additional problems. On page 73 EPA states that “We recommend that the threshold for visibility impact from a source or group of sources be quantified in units of deciviews.” Because deciviews are logarithmic values, after individually subtracting a handful of large sources the remaining budget will become ‘negative’ because deciviews are on the logarithmic scale, not a linear scale. Another potential pitfall is that an individual source that causes less than a 10 Mm^{-1} light extinction impact produces a deciview value that is negative.

The table below is a simplified example using an extinction budget from five sources. One can see that the entire extinction budget is exhausted after only the third unit is removed yet there is still light extinction from two more units occurring. As a result units 4 and 5 would not need to be analyzed using the four-factors, which will limit the visibility benefits that could be achieved in the planning period. Unit 5 demonstrates the second problem of having a negative deciview value despite impacting visibility.

	Total	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Extinction Mm ⁻¹	110	32	30	22	19	7
Deciviews	23.97895	11.63151	10.98612	7.884574	6.418539	-3.56675
Budget using DV subtraction	23.97895	12.34744	1.361322	-6.52325	-12.9418	-9.37504

As stated above, it is useful to compare two dv values to determine the difference between them for comparison to a threshold, but unlike extinction, deciviews cannot be added to give a comparable total. Thus MANE-VU recommends that the extinction budget be based on light extinction or a surrogate of light extinction (such as emissions/distance) but not on deciviews.

Comment 8

MANE-VU supports the following statement found on page 74 of the draft guidance:

“A state should not carry into the second implementation period pre-conceptions formed in the first implementation period regarding what level of estimated visibility impact is cause for concern and action. The BART guidelines allowed states to use a deciview value of 0.5 for visibility impacts (specifically, the 98th percentile impacts predicted by the CALPUFF air quality model) as the upper limit for a state-selected threshold for subject-to-BART, and most states used this value. However, there is no similar provision the Regional Haze Rule with respect to reasonable progress requirements, and this value should not be used as a screening threshold for reasonable progress purposes. The EPA expects that visibility impacts and available benefits from many individual sources estimated with the methods and metrics recommended in this guidance will be notably lower than 0.5 deciview, yet additional control of some of those will be necessary to make reasonable progress.”

Comment 9

51.308(f)(2)(v) says that states must consider mobile sources in their long term strategy, but on page 79 the guidance states that “a state does not need to perform a reasonable progress analysis for sources/controls over which the state does not have regulatory authority” and goes on to cite new mobile sources as an example. We also find this language to be contradictory. The final document should clarify EPA’s intent regarding mobile sources.

Comment 10

According to the proposed guidance, Class I area states are to set reasonable progress goals (RPG) based on the predicted visibility outcome of upwind states’ decisions on what measures are needed for reasonable progress. This is problematic. First, establishing a Class I area’s RPG is dependent on the upwind area states completing their four-factor analyses in a timely manner. MANE-VU states are expecting to complete this work in 2017 in order to submit SIPs in 2018. Within EPA’s current rulemaking, upwind states could look to utilize the extra three years being afforded by the proposed rule revisions. This would virtually assure that the upwind states will not have completed their analysis in time to be included in MANE-VU states’ SIPs.

Second, for Class I area states, complying with the spirit and letter of the regional haze program is dependent on the proper application of the four-factor analysis principles by the upwind states and EPA's role in assuring it occurs. Inherent in that is the uniform application of those principles nationally. Our experience in the first round of regional haze is that not all upwind states were enthusiastic as the Class 1 area states to address visibility impacts. This resulted in a differential in control scenarios in states impacting the same Class I areas. EPA needs to assume its leadership role to require the proper application of the four-factor analysis to set a level playing field and assure that reasonable progress is truly happening. Choosing reasonable controls cannot be left up to the states as the guidance suggests.

Comment 11

To ensure ease of collaboration among the eastern states, the final guidance should state positively the acceptability of 2011 as a base year for modeling purposes for this round of SIPs. 2011 is the more recent year that is both an NEI year and has meteorological regimes in the Eastern US that were conducive to regional fine particulate formation and thus acceptable for use in regional haze modeling according to Section 2.3.1 of EPA's "Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze."

Summary

MANE-VU appreciates the opportunity to comment on EPA's draft regional haze guidance. This guidance will be a vital resource for states as they conduct the analyses necessary to plan for reducing impairment from anthropogenic pollution affecting Class I areas during the second regional haze planning period.

Please do not hesitate to contact me at 202-508-3842 or at dfoerter@otcair.org with any questions or comments.

Sincerely,



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Cc: MANE-VU Air Directors