

VISTAS

Visibility Improvement – State and Tribal Association of the Southeast

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January 11, 2002

Ms. Lara P. Autry
U.S. Environmental Protection Agency
MD-14
Research Triangle Park, N.C. 27711

Dear Ms. Autry:

Thank you for the opportunity to review the two draft guidance documents, Draft Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule and Draft Guidance for Tracking Progress Under the Regional Haze Rule, hereafter referred to as “Estimating Natural Visibility Conditions” and “Tracking Progress”, respectively. On behalf of Visibility Improvement – State and Tribal Association of the Southeast, (VISTAS), I would like to offer the following comments. These comments were developed through conference calls with our workgroup members and review of draft comments. Individual VISTAS members may elect to send separate comments on the guidance documents.

Process/General Comments:

- VISTAS is concerned about the statement in Section 1.2 of the Tracking Progress guidance concerning revision of the guidance without public notice. No guidance with such far-reaching impacts should be revised without the opportunity of the affected parties to review and comment. The States, Tribes, local agencies, affected industries and public interest groups should all be involved in the process of revising the guidance. This comment applies to the Tracking Progress and Estimating Natural Visibility Conditions guidance.
- VISTAS firmly believes that this guidance should be treated as guidance and not treated as a fully adopted regulation. VISTAS hopes that EPA recognizes the need for flexibility in implementing the regional haze program. An appropriate approach is to continue viewing the guidance as portraying possible procedures, but allowing for alternative techniques, methodologies, etc. as full implementation of the regional haze rule begins.

Estimating Natural Visibility Conditions:

- The Estimating Natural Visibility Conditions guidance document needs to provide a more detailed description of the methods used to calculate $f(\text{RH})$ for natural background and the procedures for seasonally distributing the $f(\text{RH})$ from the annual natural background. The methods, particularly the Ames and Malm report, were not available in the peer review literature prior to development of the guidance. These critical methods, which underlie the entire guidance, should be described more fully. The critical assumptions and applications of judgement should be tested, presented in open literature, and made more readily available for scientific peer and public review prior to the guidance being finalized.
- The documents need to be consistent with respect to guidance on how to handle days with relative humidity $>98\%$. For example, should these days be dropped or should RH values $>98\%$ be replaced with 98%. Also, a different reference to a procedure for treating days with $\text{RH} > 95\%$ is made in one of the documents.
- VISTAS questions whether $f(\text{RH})$ should also be assigned to organics. We recognize that the guidance follows the same assumptions as the rule, which follows the IMPROVE protocol. VISTAS believes that there should be further investigation into the $f(\text{RH})$ assumptions for organics.
- Trojonis, 1990, assumes only two values for natural background, one for the eastern U.S. and one for the western U.S. Applying these values would create a split in the central U.S. that would be particularly relevant to CENRAP's work. This abrupt change does not exist in the natural environment, so some smoothing of the two values is suggested for the central U.S. Natural background concentrations are provided for two subregions of the country (i.e., East and West) without adequate regard for the "spatial variations in the natural aerosol levels would be expected" "within these two subregions". (Guidance document on p. 2-1.) In fact, the guidance document uses Trijonis' western estimates for the entire western United States, including the Pacific Northwest, even though they were only intended for use in the mountain/desert regions of the West.
- Table 2-1 contains the following errors:
 - The row labeled "organic carbon" actually represents organic mass concentration (OMC in Equation 1 on page 2-5). The relationship used by IMPROVE is $\text{OMC} = 1.4 \times \text{OC}$.
 - The third footnote to the table gives the wrong values: Trijonis' estimates for organics (i.e., OMC) were $1.5 \mu\text{g}/\text{m}^3$ for the East and $0.5 \mu\text{g}/\text{m}^3$ for the West.
- The guidance document fails to point out the uncertainty in its estimates of the natural background light extinction, which is discussed in the work by Trijonis for NAPAP that is the source of those estimates. Trijonis suggests that his estimates can be in error by a factor that is around 2 for every component.

- IMPROVE assumes all sulfate is ammonium sulfate. Recent NH₄ monitoring by IMPROVE at Great Smoky Mountains, TN, Shenandoah, VA, and Dolly Sods, WV indicates that sulfate aerosols frequently occur as sulfuric acid and ammonium bisulfate. Given this understanding, is it appropriate to assume that all sulfate is fully neutralized under natural conditions? This uncertainty should be addressed.
- Equation 1 (on page 2-5) implicitly assumes that the same f(RH) is appropriate for varying levels of sulfate ammoniation (i.e., neutralization), although there is no explicit statement to that effect and the Tracking Progress guidance document states (p. 3-8) that “the sulfate f(RH) function is quite different for the East than West because of sulfate ammoniation.”
- The guidance document relies on the use in the IMPROVE formula of fixed extinction efficiencies (the numerical coefficients in Equation 1) for each of the mass components, even though Malm (2000, p. 6-47) describes different coefficients for various species. Furthermore, the composition and structure of aerosol under natural conditions is likely to be different than under polluted conditions (from which these extinction efficiencies were derived). This uncertainty should be addressed.
- In Section 3.2, EPA proposes that a refined approach to estimating natural background levels “might account for infrequent natural events, such as forest fires or wind-blown dust, as major influences on visibility” without explaining how to do so in the context of Section 1.14’s assumption that Trijonis’ estimates of natural background concentrations include the natural regional contribution by fire.
- Section 3.4 specifies that States wishing to employ a refined approach should demonstrate that the refined approach provides “improved” natural visibility estimates compared to those of the default approach without defining what constitutes an “improved” estimate.
- The first paragraph of Section 1.11 refers to the IMPROVE methodology for calculation of light extinction from measurements of five components of fine mass, but omits coarse mass concentration and an assumed Rayleigh scattering.

Tracking Progress:

- VISTAS recommends a more thorough emphasis on the need to take into account differences in measurement methods when looking at trends. This is true whether using speciated PM monitored compared to federal reference method or IMPROVE. VISTAS also recommends that data other than IMPROVE data should be acceptable for the purpose of tracking progress. For example, if monitoring data is available in or near a Class I area for species such as NH₄, this data should be used since this species is not measured by IMPROVE, and an understanding of what is happening with the NH₄ trend will be useful in understanding the whole visibility picture.

- VISTAS suggests that the equation for reconstructing aerosol mass needs to be better documented, and possibly better analyzed. In the current work, Bill Malm compared western sites with 2 eastern sites, and VISTAS questions whether that level of analysis for the eastern U.S. is sufficient.
- Concerning Section 1.11 of the Tracking Progress guidance, one year is an inadequate time to perform an analysis, develop a SIP revision and take that SIP revision through the public hearing and state adoption process. More time needs to be allowed for this SIP revision. The guidance suggests that if a state is not meeting goals for reasonable progress, the state has 1 year to revise the SIP if impacting sources are within the state. If impacting sources are from out of state, then a longer period of time (next 5 year milestone) is allowed before the SIP revision. VISTAS contends that if there is a failure to make progress, it is unlikely that failure is due to one source, or even a group of sources within a single state. VISTAS recommends that the guidance be changed to say: "If there is a failure to meet reasonable progress goals, the state must submit a schedule for the analysis of the failure, and a commitment that the shortfall will be addressed at the next SIP update."
- As written, the guidance implies that the regional planning organization (RPO) is discontinued unless states are making reasonable progress. It is the VISTAS perspective that the RPO process would continue after the initial SIP submittal and that the States and Tribes would work together to analyze the reasonable progress, then continue working for the SIP updates due every ten years.
- The guidance needs to better address which types of fires will be considered in the tracking progress analysis. In addition, it appears that a tracking database is needed for this effort. VISTAS recommends that EPA develop such a tracking database and provide guidelines on the necessary information needed to be collected for these purposes.
- The section on missing data needs to be tested, so that the meaning of the guidance is clear. VISTAS members read through the guidance several times before understanding the process. VISTAS recommends that the approach be field tested to ensure that the guidance can be followed consistently.
- VISTAS recommends documentation of the regional haze guidance documents decision making process, options considered, and why options were rejected. This is suggested because the program extends over so many decades and expertise will be lost as participants retire.
- The last sentence of Section 3.3 (Tracking Progress p. 3-5) should also note that, in some locations, a major constituent of the coarse mass fraction is sea salt or its reaction product sodium nitrate.
- The "good agreement" between measured and calculated extinction that is attributed to Malm et al. (1996) was only established for 18 western IMPROVE sites, not as suggested here, for the entire IMPROVE network (Tracking Progress, last sentence of Section 3.4).

- Section 3.6, p 3-13, indicates that the EPA-sponsored project to develop climatologically-representative monthly-average values of f(RH) throughout the country processed hourly RH values below 95%, while the contractor report for the project (SAIC, 2001) states that values up to 98% RH were processed.

Again, thank you for the opportunity to comment. I trust these comments will be duly considered in the development of the final guidance documents.

Sincerely,

/s/

John E. Hornback, Director
VISTAS