

October 21, 2005

VIA ELECTRONIC MAIL

Ms. Rosalina Rodriguez
North Carolina Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601
Rosalina.Rodriguez@ncmail.net

*RE: VISTAS BART Implementation
Draft BART CALPUFF Modeling Protocol Comments*

Dear Ms. Rodriguez:

Trinity Consultants (Trinity) appreciates this opportunity to submit comments to the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) regarding the revised draft "Protocol for the Application of the CALPUFF Model for Analyses of Best Available Retrofit Technology (BART)" (hereafter, simply "Protocol") issued by VISTAS on September 20, 2005. Trinity is not submitting these comments on behalf of any particular industrial source or stakeholder; however, we are offering our informed comments based on more than a decade of experience working with state/local agencies and Federal Land Managers (FLM) throughout the country on behalf of industrial clients, many of whom are BART-eligible sources. Trinity has conducted nearly 25 CALPUFF analyses as part of Prevention of Significant Deterioration (PSD) permit applications for sources in the VISTAS region and nearly 75 analyses nationwide since 1998. We expect that VISTAS is already aware of most of the questions and concerns described in the following comments, but we wish to articulate and emphasize several points we believe will make an important difference in successful BART implementation across the VISTAS region.

To briefly summarize our comments, Trinity believes VISTAS should redirect its efforts in working with its CALPUFF modeling contractor to prepare member state/local agencies to focus on source-specific, refined CALPUFF analyses for BART applicability assessment and net visibility improvement determination. We appreciate VISTAS' interest in providing a consistent platform for performing the BART analyses to facilitate the efforts of BART-eligible sources and state/local agencies, and we do believe that all sources should be afforded the opportunity to conduct screening modeling for the purposes of BART applicability assessment. However, Trinity believes the proposed approach will not serve its intended purpose and that many sources and agencies would benefit from additional time and resources in preparing and reviewing source-specific, refined analyses. Because the ultimate deadline for Regional Haze SIP submittal in December 2007 cannot be extended, we believe VISTAS needs to take immediate action to afford stakeholders the additional time necessary to analyze their individual facilities using refined data and modeling techniques. The following comments provide the bases for this recommendation and specific actions Trinity encourages VISTAS and state/local agencies to consider in moving forward promptly with BART CALPUFF analyses.

COMMENTS ON SCREENING MODELING APPROACH

Trinity believes concerns about the technical performance of the CALPUFF model and its application for BART analyses have been well articulated by the modeling community at large in U.S. EPA's BART implementation guidelines and VISTAS draft Protocol. Therefore, the scope of our comments is limited primarily to procedural concerns about BART implementation and a strategic allocation of resources to meet the needs of stakeholders. Based on our experience with CALPUFF, we have serious concerns about the progress of VISTAS coordination of BART modeling among member state and local regulatory agencies. We understand and appreciate VISTAS objective for providing a common regional protocol, screening methodology, and meteorological data resources to promote consistency in the application of CALPUFF. However, our experience leads us to believe the proposed screening approach is not well suited for the majority of BART-eligible sources for reasons described in these comments. We encourage VISTAS and state/local agencies to allow screening analyses and consider their results; however, we are concerned that critical time, efforts, and resources may be misspent trying to apply screening instead of refined methods. Given the anticipated schedule for BART modeling, we do not believe adequate time will be available for state and local agencies to properly assess and consider stakeholder comments on case-by-case modeling analyses upon which most BART-eligible source will rely if the next two to three months are devoted to formulating inputs and methodologies for the screening techniques.

Both the U.S. EPA's BART implementation guidelines and the VISTAS Protocol indicate that source-specific modeling, as well as alternative models, may be utilized on a case-by-case basis to perform the BART applicability modeling and net visibility improvement determination. The proposed screening approach is described as a "simple procedure to evaluate whether a source can be exempted from BART controls using a consistent set of meteorological and dispersion options." Screening "is designed to ensure conservatism by considering the highest visibility impact value over a three-year simulation period rather than the 98th percentile value in making a determination of no contribution to visibility impairment and also by using conservative model settings," which requires only "modest computational resources." The conservative model settings to be used in the screening analysis include (among others) use of a 12-km CALMET meteorological and CALPUFF computational grid, neglecting ammonia-limiting effects, and disabling puff-splitting algorithms from the model. It is generally recognized, and was articulated at the VISTAS Joint Workgroup Meeting held on September 21, 2005, that these settings will result in conservative estimates of 24-hour average visibility impact in most, but not necessarily all, applications of CALPUFF, and that specific circumstances of topography, meteorology, and source characteristics have an important influence on visibility impacts. These important source-specific characteristics cannot be represented well in a generalized screening approach and their importance suggests that a refined analysis is warranted in most cases.

Trinity believes that screening modeling will appropriately represent some sources' actual impacts on visibility impairment, and therefore should be made available as an option to BART-eligible sources. Our experience and comparative analyses using VISTAS screening and refined methods confirms expectations that the proposed screening approach will be conservative. Trinity finds that the proposed screening approach consistently estimates visibility impacts from 1.5 to 5 times higher than the refined approach due solely to differences in the grid spacing and interpretation of results using the peak instead of the 98th percentile 24-hour average visibility change. We expect that screening method results would be even more conservative when

compared to a refined analysis that includes application of the ammonia-limiting method with boundary conditions.

Although these results reflect favorably on the design of the proposed screening approach, we are concerned that the screening analysis will be inconclusive for the many facilities whose actual emission levels cause visibility impacts within an order of magnitude of the BART contribution threshold of 0.5 deciviews. Given the uncertainty and conservatism in the screening methodology, we expect any facility whose screening impact is found to be up to 5 deciviews (perhaps higher) will pursue the refined analysis, and therefore seek to develop a source-specific modeling protocol in cooperation with the state/local agency. All stakeholders are well aware of the implications of being determined to cause or contribute to visibility impairment, and VISTAS should not expect any facilities to simply rely on the screening analysis to determine whether or not a BART determination, and potentially costly emissions controls, would be required.

RECOMMENDATIONS FOR REFINED ANALYSES

Because it is imperative that source-specific analyses be closely coordinated with the state or local agency, FLM, and U.S. EPA, we believe as much time as possible should be made available to facilitate these discussions. We encourage VISTAS to consider allocating its remaining resources toward development of the following common tools that could be used for refined analyses. These tasks would better serve stakeholders by removing uncertainty from refined analyses and allowing the BART-eligible source and state/local agency to focus on the source-specific aspects of the analysis.

- ▲ Provide corrected MM5 runs that do not require the state/local agency or stakeholder to manipulate the sea-surface temperature data through the supplemental use of buoy data and manually correct precipitation data to remove cumulative precipitation records. Though the problems with the existing data set and solutions are well characterized, requiring individual sources or state/local agencies to perform these corrections would cause redundant effort of already limited resources and further open the source-specific analysis to scrutiny.
- ▲ Provide standard, quality-assured National Weather Service (NWS) observations of surface, upper air, and precipitation observations and National Data Buoy Center (NDBC) buoy observations throughout the domain for use in refined analyses for which the hybrid MM5/NWS approach is preferred. The scope of this task is not trivial, but we believe would be valuable to minimize review time of source-specific analyses. Trinity's *BREEZE*® data services group archives NWS and NDBC observations and could assist VISTAS in efficiently preparing these data for distribution.
- ▲ Provide appropriate ammonia boundary conditions and background model runs for refined (4 km) domains around Class I areas within the VISTAS domain. We encourage consideration of using CMAQ modeled ammonia distributions for this purpose in areas of sparse ambient monitoring data.
- ▲ Provide appropriate ambient ozone data files for refined domains around Class I areas within the VISTAS domain. For ozone, we also encourage consideration of using CMAQ

modeled ozone distributions, especially in areas of sparse ambient monitoring data. We also seek additional information and justification for utilizing only non-urban ozone measurements in CALPUFF as is suggested on page 40 of the draft Protocol. Although there may be valid technical or procedural reasons for this recommendation, they are not apparent.

We believe it is appropriate and essential that VISTAS provide the preceding tools so that BART-eligible sources and state/local agencies can focus on the key aspects of the source-specific analysis.

SOURCE-SPECIFIC EMISSIONS SPECIATION

Among several source-specific concerns, Trinity's experience suggests that the definition of highest 24-hour average actual emissions including a speciated profile of particulate matter will be the most challenging. This part of the analysis is especially important due to the widely varying effects of different types of particulate matter on visibility. The extinction coefficient ranges in value from 0.6 m²/g for coarse particles, to 1.0 m²/g for fine inorganic particulate matter, to 3 m²/g for sulfate and nitrate precursors, to 4 m²/g for organic aerosols, up to 10 m²/g for elemental carbon. A generalized, conservative, or arbitrary assignment of particulate emissions to different pollutant categories can therefore have a considerable influence on modeled visibility impacts attributable to a single facility and the use of conservative estimates and lack of source-specific data would diminish the certainty and value of the screening analysis.

Only within the past two years have FLM required detailed emissions speciations be modeled for PSD CALPUFF analyses. Consequently, there are extremely limited data on appropriate speciations of organic/inorganic and filterable/condensable emissions by source category, not to mention individual BART-eligible sources. The National Park Service provides guidance only for gas- and oil-fired combustion turbines, and a recommended speciation for coal combustion is also available and provided as an example in the draft Protocol. However, these templates will be of minimal value for the remaining potentially BART-eligible source categories. Trinity recently performed CALPUFF modeling for a lime plant, wood products mill, fiberglass plant, and kraft pulp mill and found the process of preparing the emissions speciation for these distinct sources to be a time consuming task due to the dearth of reliable stack testing and/or emission factor data for most industrial processes, and the need to perform a thorough engineering evaluation of the source and its site-specific parameters. We find it unlikely that VISTAS and state/local agencies will have a different experience during BART implementation, since the needed data are no more available to regulatory agencies than they are to affected sources, and potentially even less available. Analogously, except in the case of facilities that operate continuous emission monitors on all affected equipment, the state/local agency would have little knowledge of actual emissions on the time resolution (24-hour average) indicated for BART modeling. We therefore encourage VISTAS to focus its attention on this issue by coordinating with state/local agencies to immediately work with potentially BART-eligible sources to collect this information and begin refined modeling analyses.

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Again, Trinity appreciates the chance to provide comments on the draft Protocol and we welcome the opportunity to work with VISTAS and/or member state/local agencies to implement any or all of the recommendations we have offered in this letter. If you have any questions or comments about the information presented in these comments, please do not hesitate to call me at (404) 256-1919. We look forward to continuing to work as a stakeholder in the very important BART implementation process.

Sincerely,

TRINITY CONSULTANTS

A handwritten signature in blue ink that reads "Ryan A. Gesser". The signature is written in a cursive, flowing style.

Ryan A. Gesser  
Managing Consultant