

# MANE-VU

## Mid-Atlantic/Northeast Visibility Union

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September 17, 2001

Air and Radiation Docket and Information Center (6102)  
Attention: **Docket No. A-2000-28**  
U. S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Dear Docket:

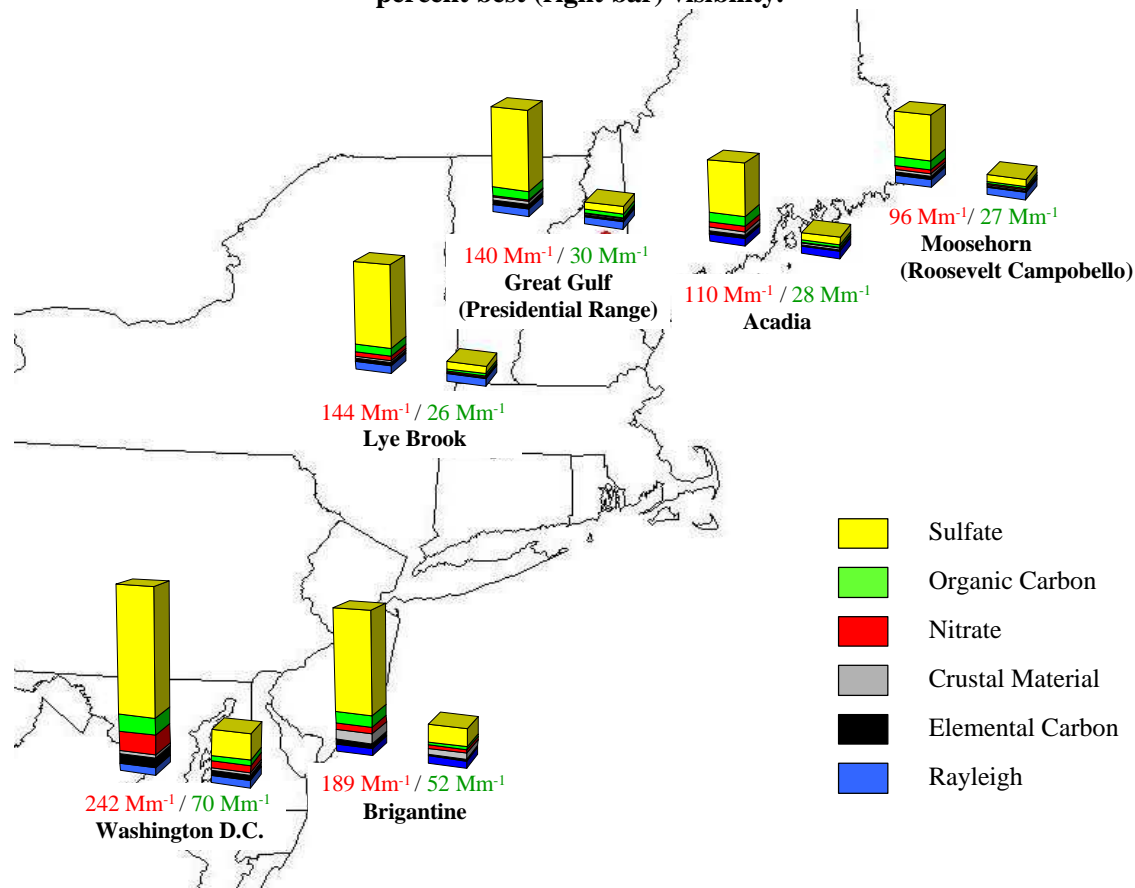
The Mid-Atlantic/Northeast Visibility Union (MANE-VU) appreciates the opportunity to comment on *Proposed Guidelines for Best Available Retrofit Technology (BART) Determinations Under the Regional Haze Regulations* which appeared in the July 20, 2001 issue of the Federal Register. MANE-VU is a regional planning organization recently formed to support the planning efforts of its members as they prepare to comply with visibility requirements under the regional haze rule [64 Fed. Reg. 35714 (July 1, 1999)]. The organization's membership includes: Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, the Penobscot Indian Nation, Rhode Island, the St. Regis Mohawk Tribe, Vermont, as well as federal land management agencies and the U.S. EPA.

Emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) from stationary sources are a major concern to the states and tribes charged with remedying visibility impairment in the Mid-Atlantic and Northeast Region. In fact the sulfate fraction of particulate matter (PM), formed from precursor emissions of SO<sub>2</sub>, is responsible for over two-thirds of the visibility impairment at mandatory Class I Federal Areas in the Northeast and Mid-Atlantic (i.e., those wilderness areas and parks regulated under the regional haze rule) on days with the worst visibility conditions (see Figure 1; NESCAUM, 2001a). The nitrate fraction of particulate matter is formed from precursor emissions of NO<sub>x</sub> and currently contributes less to visibility impairment, relative to sulfate, on the days with the worst visibility conditions; however, it plays a more significant role in PM formation during winter months (see Figure 2). Additionally, nitrate may play a far more significant role in visibility impairment if SO<sub>2</sub> controls are successful at substantially reducing sulfate precursor species leaving ammonia available to form ammonium nitrate (NESCAUM, 2001a). Thus it is imperative that controls for SO<sub>2</sub> and NO<sub>x</sub> be implemented simultaneously.

While the regulatory driver for the regional haze rule (and consequently the BART provisions within the regional haze rule) is the protection of visibility in Class I areas it is important to note that the derived visibility benefits which result from the implementation of these regulations will be experienced across the entire MANE-VU region. The economic and quality of life benefits of improved visibility will be broadly shared by the public, whether living near or visiting a rural national park, or enjoying an improved skyline in urban locations.

In addition to visibility benefits, the substantial SO<sub>2</sub> and NO<sub>x</sub> reductions achievable through the BART program would also produce significant public health benefits by reducing the incidence of cardiac and respiratory disease linked to fine particle pollution. BART controls would also reduce acid deposition and attendant

**Figure 1: Speciated contribution to total atmospheric light extinction in or near Class I areas in the Northeast and Mid-Atlantic states on days with the 20 percent worst (left bar) and 20 percent best (right bar) visibility.**

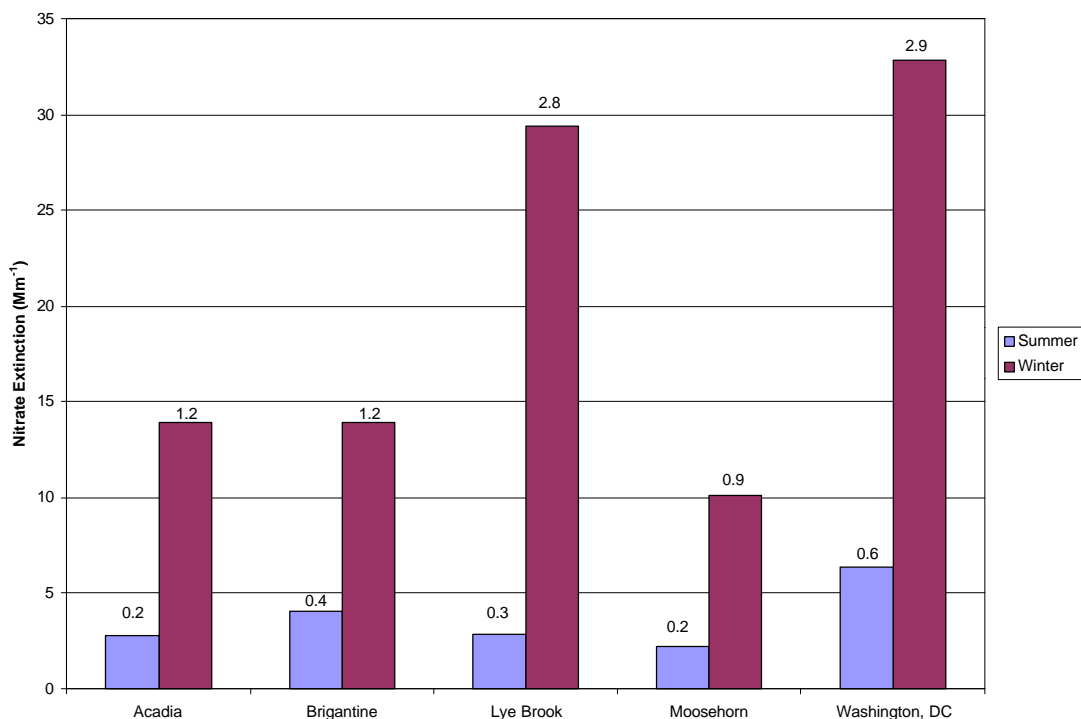


Note: The “Rayleigh” fraction of light extinction refers to the natural scattering of light by molecules of air.

acidification of soils and surface waters and prevent further destruction of sensitive aquatic ecosystems through both acidification and eutrophication.

The BART provisions in the regional haze rule provide an important first step toward the implementation of comprehensive plans to restore pristine visibility conditions to all Class I areas. These requirements could potentially result in the reduction of over five million tons annually of SO<sub>2</sub> emissions and over two million tons annually of NO<sub>x</sub> emissions from steam-electric boilers alone relative to a 1999 baseline (NESCAUM, 2001b). The BART program is critical, given the substantial geographic overlap between the largest SO<sub>2</sub>-emitting BART-eligible power plants and the source region likely to contribute to visibility impairment in MANE-VU Class I areas (see Figure 3; NESCAUM 2001b). An important issue in this regard – and one that has not been adequately addressed in the proposed guidance – is the potential overlap between BART requirements and those pending under existing regulatory programs (e.g. Title IV (acid rain program) and the NO<sub>x</sub> SIP call). As detailed more fully in a recent NESCAUM report (NESCAUM, 2001b), failure to account for potential interactions between different regulatory programs may significantly diminish the BART program’s ability to deliver visibility and public health benefits beyond those that would accrue under existing programs. Hence, MANE-VU strongly recommends that EPA revise the proposed guidelines for BART implementation to address the potential interaction of BART-generated emissions allowances and existing trading programs and more specifically to ensure that BART implementation provides for substantial additional emissions reductions that will be needed to ensure continued progress toward national visibility goals.

**Figure 2: Seasonal comparison of nitrate contribution to visibility impairment at IMPROVE sites in the Northeast and Mid-Atlantic States**



Note: The number at the top of each column represents the seasonal average nitrate contribution to fine particle mass in  $\mu\text{g}/\text{m}^3$ . Although nitrate contributions to visibility impairment are considerably larger during the winter, they remain a relatively small fraction of visibility impairment (generally <10%) relative to sulfate (60-80%).

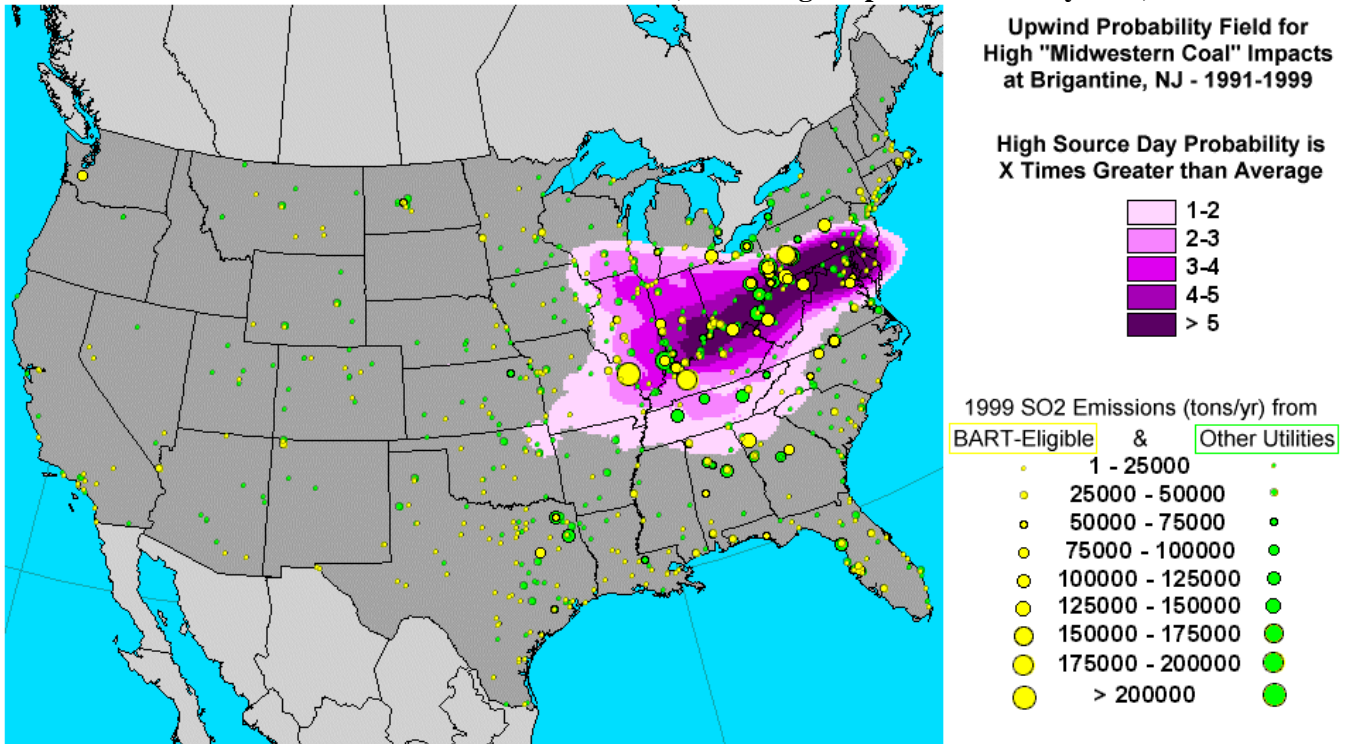
Many issues relating to the regional haze rule and the proposed BART guidelines have been investigated in reports produced for the MANE-VU regional planning organization by the Northeast States for Coordinated Air Use Management (NESCAUM). These reports, *Regional Haze and Visibility in the Northeast and Mid-Atlantic States* and *A Basis for Control of BART-Eligible Sources* are therefore included with this submission to the docket for consideration by the EPA and provide technical support for many of the specific comments on the proposed rulemaking that follow. Appropriate section titles and excerpts from the proposed rule are shown below in bold italics, followed by our specific comments.

**Statutory Requirement for BART Guidelines**

***“we request comment on whether the regional haze rule should: (1) require use of the guidelines only for 750 megawatt utilities, with the guidelines applying as guidance for the remaining categories, or (2) require use of the guidelines for all of the affected source categories.”***

We believe that that regional haze rule should require use of the guidelines for BART implementation for all of the affected source categories listed in the rule. While fossil-fuel fired electric generating plants with a capacity greater than 750 megawatts represent a substantial fraction of the potential reductions under the BART program, emissions reductions that can be achieved by application of BART to plants with a capacity less than 750 megawatts and the remaining 25 BART-eligible sectors are expected to be significant and necessary to achieve the national visibility goals. We encourage EPA to apply the proposed BART guidelines consistently across all BART-eligible sectors.

**Figure 3: Geographic regions with higher than average probability of association with “midwestern coal” impacts measured at Brigantine Wilderness Area between 1991 and 1999. Also shown are locations and emissions of Title-IV affected utilities (BART-eligible plants shown in yellow).**



**Revision to 1980 BART Guidelines for “Reasonably Attributable” Visibility Impairment**

*“Given the advances in control technology that have occurred over the past 20 years, we believe that it should be made clear that the BART analyses for reasonably attributable visibility impairment should not be based on an assumption that the NSPS level of control represents the maximum achievable level of control.”*

We strongly agree that BART analyses for reasonably attributable visibility impairment should not be based on an assumption that new source performance standards (NSPS) generally represents a maximum achievable level of control. Historically, NSPS for many categories have been revised at a slow pace (others have not been revised at all) with the net result that NSPS do not represent the state of technology for many categories. Many advances have been made over the last two decades and we have seen dramatic improvements in control technology as well as dramatic decreases in costs. “Reasonably attributable” BART analyses should consider control levels more stringent than NSPS.

**40 CFR Part 51, Appendix Y: Guidelines for BART Determinations Under the Regional Haze Rule**

***(II)(A)(1) Step 1. Identify Emission Units in the BART Categories***

*“ ‘Fossil-fuel fired boilers of more than 250 million BTU/hr heat input.’ The EPA proposes two options for interpreting this category title. The first option is the approach used in the regulations for prevention of significant deterioration (PSD).”*

EPA should interpret the source category entitled “Fossil-Fuel boilers of more than 250 million BTU/hr heat input” to be consistent with regulations for prevention of significant deterioration (PSD).

***(II)(A)(2) Step 2. Identify the Start-Up Dates of the Emission Units***

***“if an emissions unit began operation before 1962, it is not BART-eligible if it is modified at a later date, so long as the modification is not also a ‘reconstruction.’ Similarly, an emissions unit which began operation within the 1962-1977 time window, but was modified after August 7, 1977, is BART-eligible.”***

We agree with EPA’s interpretation for “modifications.” A modification to a facility that began operating within the 1962-1977 time window that is not also a “reconstruction” (and thus subject to BACT, LAER, or NSPS) should not exempt a source from BART-eligibility, assuming that modification occurred after August 7, 1977. Consistent with this interpretation, sources which began operating prior to August 7, 1962 would not be BART-eligible if they were modified during the 15-year BART time window, unless that modification was also a “reconstruction”.

***(III). How to Identify Sources “Subject to BART”***

***“the statutory language represents a very low triggering threshold. In implementing the regional haze rule, you should find that a BART-eligible source is ‘reasonably anticipated to cause or contribute’ to regional haze if the source emits pollutants within a geographic region from which pollutants can be emitted and transported downwind to a Class I area.”***

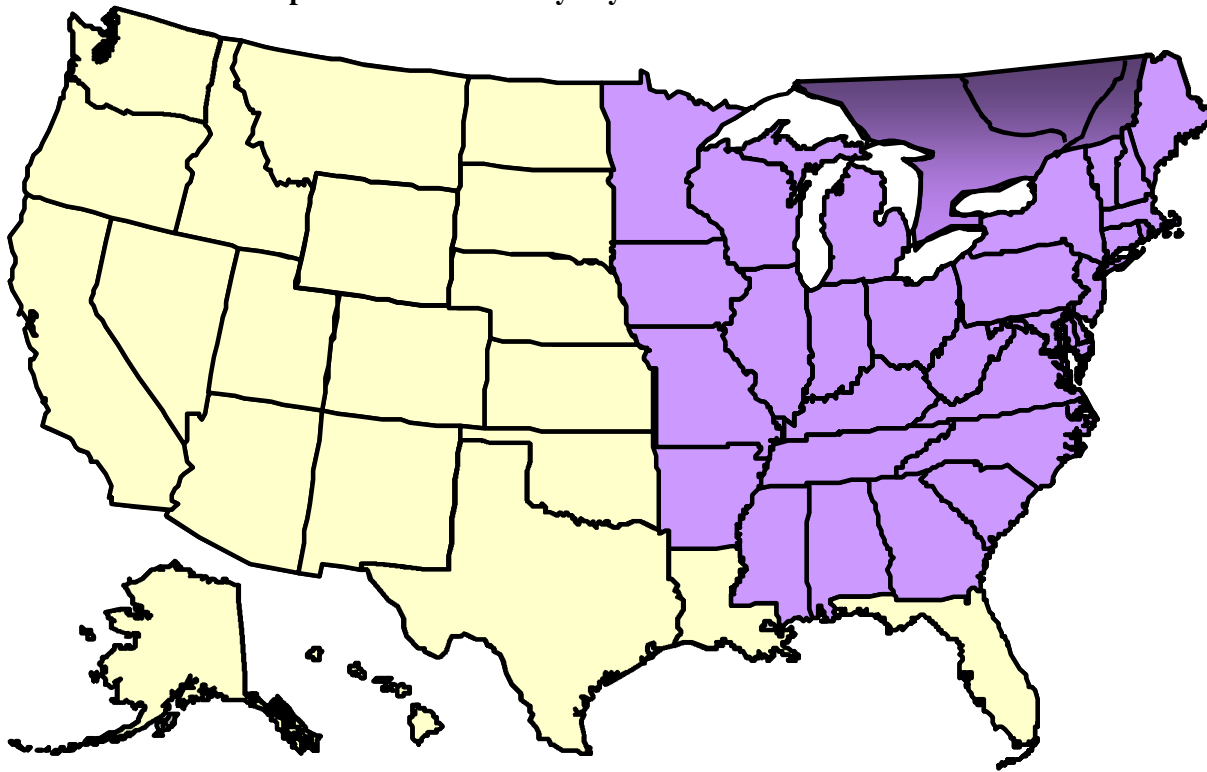
Given the degree of progress needed to meet visibility goals in the coming decades, we strongly encourage EPA to maintain proposed statutory language with respect to a “very low triggering threshold.” Specifically, we strongly agree that a source should be found “subject to BART” if it emits pollutants within a geographic region from which pollutants can be emitted and transported downwind to a Class I area.

***(III)(A). How Can I Identify “the Geographic Area” or “Region” That Contributes to a Given Class I Area?***

***“... This approach can be referred to as a ‘zero-out’ approach where you zero out the emissions from the State or area that is suspected to make a trivial contribution to visibility impairment in a Class I area. Under this approach, you would compare: (1) the visibility impairment in each affected Class I area (for the average of the 20 percent most impaired days and the 20 percent least impaired days) when the emissions from the State or area suspected to have a trivial contribution are included in the modeling analysis, and (2) the visibility impairment in each affected Class I area (for the average of the 20 percent most impaired days and the 20 percent least impaired days), excluding from the modeling analysis the emissions from the geographic area suspected to have a trivial impact.”***

MANE-VU strongly feels that allowing the “zero-out” approach for exemption demonstrations on a state-by-state basis will significantly reduce the effectiveness of the BART program by allowing individual states or geographical regions to claim “trivial” impacts. This is counterproductive to the aim of the regional haze rule to “address visibility impairment due to the cumulative air pollutant emissions from numerous sources over a wide geographic area.” Recent analyses indicate that a tentatively identified 29-state source region covering much of the eastern United States (see Figure 4; NESCAUM, 2001b) may reasonably be anticipated to cause or contribute to visibility impairment in MANE-VU class I areas. There are 149 remaining Class I areas subject to the regional haze rule, and we believe it would be difficult for any state (within the continental U.S.) to demonstrate that they have only “trivial” impact on any Class I area. MANE-VU recommends that the proposed rule be revised to establish a presumption that all geographic areas or regions of the continental U.S. contribute to regional haze in at least one Class I area.

**Figure 4: Preliminary source region reasonably anticipated to cause or contribute to visibility impairment on the 20 percent worst visibility days at Northeast and Mid-Atlantic Class I areas.**



***(IV)(B). How Does a BART Engineering Analysis Compare to a BACT Review Under the PSD Program?***

***“In this proposal, we are seeking comment on two alternative approaches for conducting a BART engineering analysis. EPA prefers the first approach.”***

MANE-VU strongly endorses the EPA preferred approach for conducting a BART engineering analysis. All available control technologies for a given source should be ranked using a “Top-Down BART” approach with descending order of control effectiveness. The most stringent alternative is selected as “best” unless it is demonstrated and documented that the alternative cannot be justified based upon technical considerations, costs, energy impacts and non-air quality environmental impacts. To consider alternative approaches for conducting a BART review, such as the consideration of *least-stringent* technologies *first*, would be counterproductive when the statutory objective is clearly aimed at identifying the best control options.

***(IV)(D)(1). Step 1: How Do I Identify All Available Retrofit Emission Control Techniques?***

***“We note that there are situations where NSPS standards do not require the most stringent level of available control for all sources within a category. ... However, such controls must still be considered available technologies for the BART selection process.”***

Consistent with earlier comments on requirements for “reasonably attributable” visibility impairment, MANE-VU strongly supports EPA in requiring all control technologies be considered for BART in a “Top-Down BART” approach, including those more stringent than NSPS for applicable source categories.

***(IV)(D)(1). Step 1: How Do I Identify All Available Retrofit Emission Control Techniques?***

***“Potentially applicable retrofit control alternatives can be categorized in three ways.***

- ***Pollution prevention: use of inherently lower-emitting processes/practices, including the use of materials and production processes and work practices that prevent emissions and result in lower “production-specific” emissions,***
- ***Use of, (and where already in place, improvements in the performance of) add-on controls, such as scrubbers, fabric filters, thermal oxidizers and other devices that control and reduce emissions after they are produced, and***
- ***Combinations of inherently lower emitting processes and add-on controls.”***

MANE-VU recommends revising the second bullet in this passage to read: “Use of, (and where already in place, improvements in the performance of) add-on controls and widely used combinations of add-on controls, such as scrubbers, fabric filters, thermal oxidizers and other devices that control and reduce emissions after they are produced” to reinforce the notion that combinations of add-on controls can greatly increase control efficiencies relative to the use of a single control technology in isolation.

***(IV)(D)(3). Step 3: How Do I Develop a Ranking of the Technically Feasible Alternatives?***

***“In some instances, a control technology may reduce more than one visibility impairing pollutant. We request comment on whether and how the BART guidelines should address the process for ranking such control technologies against control technologies which reduce emissions of only one pollutant.”***

MANE-VU supports a multi-pollutant approach to emissions reductions. To the extent that controls are capable of reducing the emissions of multiple pollutants simultaneously, these controls should be favored over single pollutant controls. Considerations of simultaneous pollutant reductions should not, however, justify reduced stringency of controls for the pollutant which is specifically targeted under the BART review.

***(IV)(D)(4). Step 4: For a BART Engineering Analysis, What Impacts Must I Calculate and Report? What Methods Does EPA Recommend for the Impacts Analysis?***

***“After you identify and rank the available and technically feasible control technology options, you must then conduct three types of impact analyses when you make a BART determination:***

***Impact analysis part 1: Costs of compliance, (taking into account the remaining useful life of the facility)***

***Impact analysis part 2: Energy impacts, and***

***Impact analysis part 3: Non-air quality environmental impacts.***

***In this section, we describe how to conduct each of these three analyses. You are responsible for presenting an evaluation of each impact along with appropriate supporting information.”***

While the guidelines are clear regarding how to document control costs, energy impacts, and non-air quality environmental impacts, they fail to clearly define what cost would be considered unreasonable, what energy impact would be considered unacceptable or what threshold environmental impact would result in the elimination of a particular technology option. While we agree that the most stringent control technologies should not be selected as BART arbitrarily or capriciously, we contend that the economic and environmental impacts of specific control

options must be weighed against the full range of expected benefits. This includes improvements in visibility, protection of public health, mitigation of acid deposition and ozone formation, and the restoration of marine ecosystem health. In addition, we propose that regulatory language be revised to indicate that only “extraordinarily high cost, energy or non-air quality environmental impacts relative to similar installations of a specific control option” must be documented for the public record before consideration of the next most stringent alternative can be considered.

In addition, MANE-VU recommends that EPA strengthen the justification for their proposed treatment of visibility improvements on a cumulative (as opposed to source-by-source) basis. We strongly agree with EPA that the proposed BART rule should require a cumulative air quality impacts analysis given the regional nature of the haze problem. EPA has successfully incorporated regional analyses into the regulatory framework for other regional problems. The recent resolution of several petitions under section 126 of the Clean Air Act and the Acid Rain Program are good examples of this. We encourage EPA to apply these same principles to the haze problem and bolster current regulatory language in the context of consideration of visibility improvement due to application of control technology at a specific source.

***(IV)(D)(4)(b). How do I take into account a project’s “remaining useful life” in calculating control costs?***

***“(The EPA recognizes that there may be situations where a source operator intends to shut down a source by a given date, but wishes to retain the flexibility to continue operating beyond the date in the event, for example, that market conditions change.) We request comment on how such flexibility could be provided in this regard while maintaining consistency with the statutory requirement to install BART within 5 years.”***

MANE-VU is concerned that if operators retain flexibility and decide to extend the life of their facilities after BART determinations have been made, then these facilities will continue to operate at a higher emission rate than if BART had been installed. We are unaware of any precedent for “federally enforceable restrictions preventing further operation” and fear that any provisions allowing for consideration of “remaining useful lifetime” in calculating control costs would reduce the effectiveness of the BART program. MANE-VU therefore recommends that no such provisions be made in the BART guidelines. If a facility subject to BART is in operation at the time of SIP submittal, it must have plans to install controls.

***(IV)(D)(4)(f). How do I calculate incremental cost effectiveness?***

***“You should consider the incremental cost effectiveness in combination with the total cost effectiveness in order to justify elimination of a control option.”***

Reasonably cost effective controls that represent the “Best Available” level of control should not be rejected in favor of controls which may be more *cost* effective but less effective in absolute terms. Some consideration of absolute emissions reduction must also be considered. MANE-VU therefore recommends that consideration of incremental cost effectiveness should only be allowed when it does not result in reduced stringency of controls over those determined using absolute cost effectiveness alone.

***(IV)(D)(5)(b). Selecting a “best” alternative***

***“Based on the cost models in the Controlling SO<sub>2</sub> Emissions report, it appears that, where there is no existing control technology in place, 90-95 percent control can generally be achieved at cost-effectiveness values that are in the hundreds of dollars per ton range or less. We are thus proposing a presumption that, for uncontrolled utility boilers, an SO<sub>2</sub>-control level in the 90-95 range is generally achievable.”***

We endorse EPA’s proposal to establish a presumed control efficiency for currently uncontrolled SO<sub>2</sub> utility boilers. A recent NESCAUM analysis (NESCAUM, 2000) indicates that flue gas desulfurization (FGD) or



“scrubber” technology is an extremely cost effective means of reducing SO<sub>2</sub> emission by over 95 percent on a routine basis currently. We therefore propose an alternative presumed control efficiency of 95 percent at a minimum for previously uncontrolled utility boilers. MANE-VU was dismayed to see changes in the language regarding presumed control efficiencies (essentially softening support) between the January draft of the proposed BART guidelines and those published in the Federal Register. As discussed in the NESCAUM report, regulation often leads to technological innovation and the presumption of FGD as BART may lead to even more advances in this technology and additional cost reductions.

In addition to the presumptive 95 percent control efficiency for SO<sub>2</sub>, we encourage EPA to establish a presumed control efficiency of 90 percent, at a minimum, for NO<sub>x</sub> emissions from uncontrolled utility boilers. An earlier NESCAUM report (NESCAUM, 1998) demonstrates that the combination of low-NO<sub>x</sub> burner (LNB) technology and Selective Catalytic Reduction (SCR) controls can routinely reduce NO<sub>x</sub> emissions by over 90 percent. The report further documents that installation of these controls can be highly cost-effective in most circumstances. MANE-VU believes that enough documentation exists to firmly establish a presumed control efficiencies for SO<sub>2</sub> and NO<sub>x</sub> and that failure to establish presumptive levels of control will significantly weaken the BART program, reducing the ability for states and tribes to effectively address visibility impairment within their jurisdictions.

***(VII)(C). What Criteria Must Be Met in Developing an Emissions Trading Program as an Alternative to BART?***

Under the steps describing a “greater reasonable progress” demonstration, EPA has indicated that trading program budget emission levels “equivalent to or less than” those expected with the installation and operation of BART may achieve greater visibility improvement. MANE-VU suggests removing the phrase “equivalent to” as it is unlikely that greater reasonable progress can be achieved with only equivalent emissions reductions.

***(VII)(C)(2). How Do I Calculate the Emissions Reductions That Would Be Achieved If BART Were Installed and Operated on These Sources?***

***“The EPA requests comment on an approach to the category-wide analysis of BART that would allow the States to evaluate different levels of BART control options (e.g., all measures less than \$1000/ton vs. all measures less than \$2000/ton vs. all measures less than \$3000/ton) through an iterative process of assessing relative changes in cumulative visibility impairment.”***

MANE-VU recommends eliminating the category-wide approach to evaluation of visibility benefits. We do not feel that States can adequately evaluate different levels of BART control options given the non-linear relationship between emissions reductions and perceived visibility benefits when expressed in deciviews (NESCAUM, 2001b). Visibility benefits calculated in deciviews will minimize the range of visibility benefits derived from any of these control options, creating the incorrect impression that any level of control would result in roughly the same visibility benefits. BART represents the first step in a six-decade control program. We are, therefore, comparing visibility benefits of emissions reductions against the worst baseline conditions, and thus the most difficult conditions under which to perceive a difference.

If EPA chooses to allow such evaluations to move forward despite MANE-VU objections, they should be made on the basis of differences in atmospheric light extinction, or another metric that is linear with pollutant concentrations, rather than perceived visibility.

***(VII)(C)(3). For a Cap and Trade Program, How Do I Demonstrate That My Emission Budget Results in Emission Levels that are Equivalent To or Less Than the Emissions Levels That Would Result If BART Were Installed and Operated?***

Consistent with our comment on (VII)(C) of the proposed rule, we would encourage EPA to remove references to “equivalent” emissions reductions as satisfactory for achieving greater reasonable progress than source-by-source application of BART. References are found in the title of this section as well as under the steps for evaluating whether the program milestone for the year 2018 provides for a BART-equivalent or better emission inventory total.

***(VII)(C)(4). How Do I Ensure That Trading Budgets Achieve “Greater Reasonable Progress?”***

***“The EPA recognizes that it is desirable to minimize administrative burdens for sources that may be subject to the provisions of several different emission trading programs.”***

We agree with EPA that it is desirable to minimize administrative burdens. We recommend that estimates of BART-eligible emissions reductions and emissions budgets be calculated for the end of the first BART compliance period (2013) taking into account any reductions which are required under other control programs by that time. The eligible emissions reductions for each pollutant subject to BART review (that is also regulated under existing allowance trading programs) would then be aggregated and allowances totaling greater levels of reduction should then be withheld from 2014 and all future emissions allocations.

Sincerely,



Christopher Recchia  
Commissioner,  
Vermont Department of Environmental Conservation  
Chair,  
Mid-Atlantic/Northeast Visibility Union

cc (without enclosures): John Seitz, U.S. EPA  
Tim Smith, U.S. EPA

Enclosures: *Regional Haze and Visibility in the Northeast and Mid-Atlantic States, A Basis for Control of BART- Eligible Sources*

**References:**

NESCAUM, *Status Report on NOx: Control Technologies and Cost Effectiveness of Utility Boilers*, Northeast States for Coordinated Air Use Management, Boston, MA, September, 1998.

NESCAUM, *Environmental Regulation and Technology Innovation: Controlling Mercury Emissions from Coal-Fired Boilers*, Northeast States for Coordinated Air Use Management, Boston, MA, September, 2000.

NESCAUM, *Regional Haze and Visibility in the Northeast and Mid-Atlantic States*, Northeast States for Coordinated Air Use Management, Boston, MA, January, 2001a.

NESCAUM, *A Basis for Control of BART-Eligible Sources*, Northeast States for Coordinated Air Use Management, Boston, MA, July, 2001b.