6560-50-P

ENVIRONMENTAL PROTECTION AGENCY
40 CFR Part 52
[EPA-R01-OAR-2008-0599; A-1-FRL-9639-1]

Approval and Promulgation of Air Quality Implementation Plans; New Hampshire; Regional Haze

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing approval of a revision to the New Hampshire State Implementation Plan (SIP) submitted by the New Hampshire Department of Environmental Services (NHDES) on January 29, 2010, with supplemental submittals on January 14, 2011, and August 26, 2011, that addresses regional haze for the first planning period from 2008 through 2018. This revision addresses the requirements of the Clean Air Act (CAA) and EPA's rules that require States to prevent any future, and remedy any existing, manmade impairment of visibility in mandatory Class I areas (also referred to as the "regional haze program"). States are required to assure reasonable progress toward the national goal of achieving natural visibility conditions in Class I areas.

DATES: Written comments must be received on or before **[Insert date 30 days after publication in the Federal Register]**.

ADDRESSES: Submit your comments, identified by Docket ID Number EPA-R01-OAR-2008-0559 by one of the following methods:

1. www.regulations.gov : Follow the on-line instructions for submitting comments.
2. E-mail: arnold.anne@epa.gov

3. Fax: (617) 918-0047.
4. Mail: “Docket Identification Number EPA-R01-OAR-2008-0599 Anne Arnold, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, (Mail code OEP05-2), Boston, MA 02109 - 3912.
5. Hand Delivery or Courier. Deliver your comments to: Anne Arnold, Manager, Air Quality Planning Unit, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, (mail code OEP05-2), Boston, MA 02109 - 3912. Such deliveries are only accepted during the Regional Office’s normal hours of operation. The Regional Office’s official hours of business are Monday through Friday, 8:30 to 4:30, excluding legal holidays.

Instructions: Direct your comments to Docket ID No. EPA-R01-OAR-2008-0599. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit through www.regulations.gov, or e-mail, information that you consider to be CBI or otherwise protected. The www.regulations.gov website is an “anonymous access” system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through www.regulations.gov your e-mail address will be automatically captured and included as part of the comment that is placed

in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the electronic docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, i.e., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in www.regulations.gov or in hard copy at Office of Ecosystem Protection, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, Boston, MA. EPA requests that if at all possible, you contact the contact listed in the **FOR FURTHER INFORMATION CONTACT** section to schedule your inspection. The Regional Office's official hours of business are Monday through Friday, 8:30 to 4:30, excluding legal holidays.

In addition, copies of the State submittal are also available for public inspection during normal business hours, by appointment at the Air Resources Division, Department of Environmental Services, 6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095.

FOR FURTHER INFORMATION CONTACT: Anne McWilliams, Air Quality Unit, U.S. Environmental Protection Agency, EPA New England Regional Office, 5 Post Office Square – Suite 100, (Mail Code OEP05-02), Boston, MA 02109 – 3912, telephone number (617)918-1697, fax number (617)918-0697, e-mail mcwilliams.anne@epa.gov

SUPPLEMENTARY INFORMATION:

Table of Contents

Throughout this document, wherever "we," "us," or "our" is used, we mean the EPA.

I. What is the Background for EPA's Proposed Action?

A. The Regional Haze Problem

Regional haze is visibility impairment that is produced by a multitude of sources and activities which are located across a broad geographic area and emit fine particles and their precursors (e.g., sulfur dioxide, nitrogen oxides, and in some cases, ammonia and volatile organic compounds). Fine particle precursors react in the atmosphere to form fine particulate matter ($PM_{2.5}$) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust), which also impair visibility by scattering and absorbing light. Visibility impairment reduces the clarity, color, and visible distance that one can see. $PM_{2.5}$ can also cause serious health effects and mortality in humans and contributes to environmental effects such as acid deposition.

Data from the existing visibility monitoring network, the "Interagency Monitoring of Protected Visual Environments" (IMPROVE) monitoring network, show that visibility impairment caused by air pollution occurs virtually all the time at most national park and wilderness areas. The average visual range in many Class I areas (i.e., national parks and memorial parks, wilderness areas, and international parks meeting certain size criteria) in the Western United States is 100-150 kilometers, or about one-half to two-thirds of the visual range that would exist without

manmade air pollution. In most of the eastern Class I areas of the United States, the average visual range is less than 30 kilometers, or about one-fifth of the visual range that would exist under estimated natural conditions. See 64 FR 35715, (July 1, 1999).

B. Background Information

In section 169A(a)(1) of the 1977 Amendments to the CAA, Congress created a program for protecting visibility in the nation's national parks and wilderness areas. This section of the CAA establishes as a national goal the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas[1] which impairment results from manmade air pollution." On December 2, 1980, EPA promulgated regulations to address visibility impairment in Class I areas that is "reasonably attributable" to a single source or small group of sources, i.e., "reasonably attributable visibility impairment" (RAVI). See 45 FR 80084, (Dec. 2, 1980). These regulations represented the first phase in addressing visibility impairment. EPA deferred action on regional haze that emanates from a variety of sources until monitoring, modeling and scientific knowledge about the relationships between pollutants and visibility impairment were improved.

[1] Areas designated as mandatory Class I Federal areas consist of national parks exceeding 6000 acres, wilderness areas and national memorial parks exceeding 5000 acres, and all international parks that were in existence on August 7, 1977 (42 U.S.C. 7472(a)). In accordance with section 169A of the CAA, EPA, in consultation with the Department of Interior, promulgated a list of 156 areas where visibility is identified as an important value (44 FR 69122, November 30, 1979). The extent of a mandatory Class I area includes subsequent changes in boundaries, such as park expansions (42 U.S.C. 7472(a)). Although States and Tribes may designate as Class I additional areas which they consider to have visibility as an important value, the requirements of the visibility program set forth in section 169A of the CAA apply only to ''mandatory Class I Federal areas." Each mandatory Class I Federal area is the responsibility of a ''Federal Land Manager'' (FLM). (42 U.S.C. 7602(i)). When we use the term "Class I area" in this action, we mean a "mandatory Class I Federal area."

Congress added section 169B to the CAA in 1990 to address regional haze issues. EPA promulgated a rule to address regional haze on July 1, 1999 (64 FR 35714), the Regional Haze Rule. The Regional Haze Rule revised the existing visibility regulations to integrate into the regulation provisions addressing regional haze impairment and established a comprehensive visibility protection program for Class I areas. The requirements for regional haze, found at 40 CFR 51.308 and 51.309, are included in EPA's visibility protection regulations at 40 CFR 51.300-309. Some of the main elements of the regional haze requirements are summarized in Section II. The requirement to submit a regional haze SIP applies to all 50 States, the District of Columbia and the Virgin Islands. Forty CFR 51.308(b) requires States to submit the first implementation plan addressing regional haze visibility impairment no later than December 17, 2007. On January 15, 2009, EPA found that 37 States, the District of Columbia and the U.S. Virgin Islands failed to submit this required implementation plan. See 74 FR 2392 (Jan. 15, 2009). In particular, EPA found that New Hampshire failed to submit a plan that met the requirements of 40 CFR 51.308. See 74 FR 2393. On January 14, 2011, the Air Resources Division of the New Hampshire Department of Environmental Services (NHDES) submitted revisions to the New Hampshire State Implementation Plan (SIP) to address regional haze as required by 40 CFR 51.308. A revision to this submittal was made on August 26, 2011. EPA has reviewed New Hampshire's submittal and is proposing to find that it is consistent with the requirements of 40 CFR 51.308 as outlined in Section II.

C. Roles of Agencies in Addressing Regional Haze

Successful implementation of the regional haze program will require long-term regional coordination among States, tribal governments and various federal agencies. As noted above,

pollution affecting the air quality in Class I areas can be transported over long distances, even hundreds of kilometers. Therefore, to effectively address the problem of visibility impairment in Class I areas, States need to develop strategies in coordination with one another, taking into account the effect of emissions from one jurisdiction on the air quality in another.

Because the pollutants that lead to regional haze can originate from sources located across broad geographic areas, EPA has encouraged the States and Tribes across the United States to address visibility impairment from a regional perspective. Five regional planning organizations (RPOs) were developed to address regional haze and related issues. The RPOs first evaluated technical information to better understand how their States and Tribes impact Class I areas across the country, and then pursued the development of regional strategies to reduce emissions of $PM_{2.5}$ and other pollutants leading to regional haze.

The Mid-Atlantic/Northeast Visibility Union (MANE-VU) RPO is a collaborative effort of State governments, tribal governments, and various federal agencies established to initiate and coordinate activities associated with the management of regional haze, visibility and other air quality issues in the Northeastern United States. Member State and Tribal governments include: Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Penobscot Indian Nation, Rhode Island, and Vermont.

II. What Are the Requirements for Regional Haze SIPs?

A. The CAA and the Regional Haze Rule (RHR)

Regional haze SIPs must assure reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas. Section 169A of the CAA and EPA's implementing regulations require States to establish long-term strategies for making reasonable progress toward meeting this goal. Implementation plans must also give specific attention to certain stationary sources that were in existence on August 7, 1977, but were not in operation before August 7, 1962, and require these sources, where appropriate, to install Best Available Retrofit Technology (BART) controls for the purpose of eliminating or reducing visibility impairment. The specific regional haze SIP requirements are discussed in further detail below.

B. Determination of Baseline, Natural, and Current Visibility Conditions

The RHR establishes the deciview (dv) as the principal metric for measuring visibility. This visibility metric expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions. Visibility is determined by measuring the visual range (or deciview), which is the greatest distance, in kilometers or miles, at which a dark object can be viewed against the sky. The deciview is a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility at one deciview.[2]

The deciview is used in expressing Reasonable Progress Goals (RPGs) (which are interim visibility goals towards meeting the national visibility goal), defining baseline, current, and natural conditions, and tracking changes in visibility. The regional haze SIPs must contain measures that ensure "reasonable progress" toward the national goal of preventing and

[2] The preamble to the RHR provides additional details about the deciview. See 64 FR 35714, 35725 (July 1, 1999).

remedying visibility impairment in Class I areas caused by manmade air pollution by reducing anthropogenic emissions that cause regional haze. The national goal is a return to natural conditions, i.e., manmade sources of air pollution would no longer impair visibility in Class I areas.

To track changes in visibility over time at each of the 156 Class I areas covered by the visibility program and as part of the process for determining reasonable progress, States must calculate the degree of existing visibility impairment at each Class I area within the State at the time of each regional haze SIP submittal and periodically review progress every five years midway through each 10-year planning period. To do this, the RHR requires States to determine the degree of impairment (in deciviews) for the average of the 20 percent least impaired ("best") and 20 percent most impaired ("worst") visibility days over a specified time period at each of their Class I areas. In addition, States must also develop an estimate of natural visibility conditions for the purposes of comparing progress toward the national goal. Natural visibility is determined by estimating the natural concentrations of pollutants that cause visibility impairment and then calculating total light extinction based on those estimates. EPA has provided guidance to States regarding how to calculate baseline, natural and current visibility conditions in documents titled, *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*, September 2003, (EPA-454/B-03-005) available at www.epa.gov/ttncaaa1/t1/memoranda/rh_envcurhr_gd.pdf (hereinafter referred to as "EPA's 2003 Natural Visibility Guidance"), and *Guidance for Tracking Progress Under the Regional Haze Rule*, September 2003 (EPA-454/B-03-004), available at

www.epa.gov/ttncaaa1/t1/memoranda/rh_tpurhr_gd.pdf (hereinafter referred to as "EPA's 2003 Tracking Progress Guidance").

For the first regional haze SIPs that were due by December 17, 2007, "baseline visibility conditions" were the starting points for assessing "current" visibility impairment. Baseline visibility conditions represent the degree of impairment for the 20 percent least impaired days and 20 percent most impaired days at the time the regional haze program was established. Using monitoring data from 2000 through 2004, States are required to calculate the average degree of visibility impairment for each Class I area within the State, based on the average of annual values over the five year period. The comparison of initial baseline visibility conditions to natural visibility conditions indicates the amount of improvement necessary to attain natural visibility, while the future comparison of baseline conditions to the then current conditions will indicate the amount of progress made. In general, the 2000-2004 baseline period is considered the time from which improvement in visibility is measured.

C. Determination of Reasonable Progress Goals (RPGs)

The vehicle for ensuring continuing progress towards achieving the natural visibility goal is the submission of a series of regional haze SIPs from the States that establish RPGs for Class I areas for each (approximately) 10-year planning period. The RHR does not mandate specific milestones or rates of progress, but instead calls for States to establish goals that provide for "reasonable progress" toward achieving natural (i.e., "background") visibility conditions for their Class I areas. In setting RPGs, States must provide for an improvement in visibility for the most

impaired days over the (approximately) 10-year period of the SIP, and ensure no degradation in visibility for the least impaired days over the same period.

States have significant discretion in establishing RPGs, but are required to consider the following factors established in the CAA and in EPA's RHR: (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. States must demonstrate in their SIPs how these factors are considered when selecting the RPGs for the best and worst days for each applicable Class I area. See 40 CFR 51.308(d)(1)(i)(A). States have considerable flexibility in how they take these factors into consideration, as noted in EPA's July 1, 2007 memorandum from William L. Wehrum, Acting Administrator for Air and Radiation, to EPA Regional Administrators, EPA Regions 1-10, entitled *Guidance for Setting Reasonable Progress Goals under the Regional Haze Program* (p. 4-2, 5-1)(EPA's Reasonable Progress Guidance). In setting the RPGs, States must also consider the rate of progress needed to reach natural visibility conditions by 2064 (referred to as the "uniform rate of progress" or the "glide path") and the emission reduction measures needed to achieve that rate of progress over the 10-year period of the SIP. The year 2064 represents a rate of progress which States are to use for analytical comparison to the amount of progress they expect to achieve. In setting RPGs, each State with one or more Class I areas ("Class I State") must also consult with potentially "contributing States," i.e., other nearby States with emission sources that may be contributing to visibility impairment at the Class I State's areas. See 40 CFR 51.308(d)(1)(iv).

D. Best Available Retrofit Technology (BART)

Section 169A of the CAA directs States to evaluate the use of retrofit controls at certain larger, often uncontrolled, older stationary sources in order to address visibility impacts from these sources. Specifically, the CAA requires States to revise their SIPs to contain such measures as may be necessary to make reasonable progress towards the natural visibility goal, including a requirement that certain categories of existing stationary sources built between 1962 and 1977 procure, install, and operate the "Best Available Retrofit Technology" as determined by the State. (CAA 169A(b)(2)a)).[3] States are directed to conduct BART determinations for such sources that may be anticipated to cause or contribute to any visibility impairment in a Class I area. Rather than requiring source-specific BART controls, States also have the flexibility to adopt an emissions trading program or other alternative program as long as the alternative provides greater reasonable progress towards improving visibility than BART.

On July 6, 2005, EPA published the *Guidelines for BART Determinations Under the Regional Haze Rule* at Appendix Y to 40 CFR part 51 (hereinafter referred to as the "BART Guidelines") to assist States in determining which of their sources should be subject to the BART requirements and in determining appropriate emission limits for each applicable source. In making a BART applicability determination for a fossil fuel-fired electric generating plant with a total generating capacity in excess of 750 megawatts (MW), a State must use the approach set forth in the BART Guidelines. A State is encouraged, but not required, to follow the BART Guidelines in making BART determinations for other types of sources.

States must address all visibility impairing pollutants emitted by a source in the BART determination process. The most significant visibility impairing pollutants are sulfur dioxide

[3] The set of "major stationary sources" potentially subject to BART are listed in CAA section 169A(g)(7).

(SO_2), nitrogen oxides (NO_x), and particulate matter (PM). EPA has stated that States should use their best judgment in determining whether volatile organic compounds (VOCs), or ammonia (NH_3) and ammonia compounds impair visibility in Class I areas.

The RPOs provided air quality modeling to the States to help them in determining whether potential BART sources can be reasonably expected to cause or contribute to visibility impairment in a Class I area. Under the BART Guidelines, States may select an exemption threshold value for their BART modeling, below which a BART eligible source would not be expected to cause or contribute to visibility impairment in any Class I area. The State must document this exemption threshold value in the SIP and must state the basis for its selection of that value. Any source with emissions that model above the threshold value would be subject to a BART determination review. The BART Guidelines acknowledge varying circumstances affecting different Class I areas. States should consider the number of emission sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts. Any exemption threshold set by the State should not be higher than 0.5 deciviews. See 70 FR 39161 (July 6, 2005).

In their SIPs, States must identify potential BART sources, described as "BART-eligible sources" in the RHR, and document their BART control determination analyses. The term "BART-eligible source" used in the BART Guidelines means the collection of individual emission units at a facility that together comprises the BART-eligible source. See 70 FR 39161 (July 6, 2005). In making BART determinations, section 169A(g)(2) of the CAA requires that States consider the following factors: (1) the costs of compliance; (2) the energy and non-air

quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. States are free to determine the weight and significance to be assigned to each factor. See 70 FR 39170 (July 6, 2005).

A regional haze SIP must include source-specific BART emission limits and compliance schedules for each source subject to BART. Once a State has made its BART determination, the BART controls must be installed and in operation as expeditiously as practicable, but no later than five years after the date of EPA approval of the regional haze SIP, as required by CAA (section 169(g)(4)) and the RHR (40 CFR 51.308(e)(1)(iv)). In addition to what is required by the RHR, general SIP requirements mandate that the SIP must also include all regulatory requirements related to monitoring, recordkeeping, and reporting for the BART controls on the source. States have the flexibility to choose the type of control measures they will use to meet the requirements of BART.

E. Long-Term Strategy (LTS)

Forty CFR 51.308(d)(3) of the RHR requires that States include a LTS in their SIPs. The LTS is the compilation of all control measures a State will use to meet any applicable RPGs. The LTS must include "enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals" for all Class I areas within, or affected by emissions from, the State. See 40 CFR 51.308(d)(3).

When a State's emissions are reasonably anticipated to cause or contribute to visibility impairment in a Class I area located in another State, the RHR requires the impacted State to coordinate with the contributing States in order to develop coordinated emissions management strategies. See 40 CFR 51.308(d)(3)(i). In such cases, the contributing State must demonstrate that it has included in its SIP all measures necessary to obtain its share of the emission reductions needed to meet the RPGs for the Class I area. The RPOs have provided forums for significant interstate consultation, but additional consultations between States may be required to sufficiently address interstate visibility issues. This is especially true where two States belong to different RPOs.

States should consider all types of anthropogenic sources of visibility impairment in developing their LTS, including stationary, minor, mobile, and area sources. At a minimum, States must describe how each of the seven factors listed below is taken into account in developing their LTS: (1) emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the RPG; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the State for these purposes; (6) enforceability of emissions limitations and control measures; (7) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the LTS. See 40 CFR 51.308(d)(3)(v).

F. Coordinating Regional Haze and Reasonably Attributable Visibility Impairment

(RAVI) LTS

As part of the RHR, EPA revised 40 CFR 51.306(c) regarding the LTS for RAVI to require that the RAVI plan must provide for a periodic review and SIP revision not less frequently than every three years until the date of submission of the State's first plan addressing regional haze visibility impairment, which was due December 17, 2007, in accordance with 40 CFR 51.308(b) and (c). On or before this date, the State must revise its plan to provide for review and revision of a coordinated LTS for addressing reasonably attributable and regional haze visibility impairment, and the State must submit the first such coordinated LTS with its first regional haze SIP. Future coordinated LTS's, and periodic progress reports evaluating progress towards RPGs, must be submitted consistent with the schedule for SIP submission and periodic progress reports set forth in 40 CFR 51.308(f) and 51.308(g), respectively. The periodic reviews of a State's LTS must report on both regional haze and RAVI impairment and must be submitted to EPA as a SIP revision.

G. Monitoring Strategy and Other Implementation Plan Requirements

Forty CFR 51.308(d)(4) of the RHR includes the requirement for a monitoring strategy for measuring, characterizing, and reporting of regional haze visibility impairment that is representative of all mandatory Class I Federal areas within the State. The strategy must be coordinated with the monitoring strategy required in 40 CFR 51.305 for RAVI. Compliance with this requirement may be met through participation in the IMPROVE network. The monitoring strategy is due with the first regional haze SIP, and it must be reviewed every five years. The monitoring strategy must also provide for additional monitoring sites if the IMPROVE network is not sufficient to determine whether RPGs will be met.

The SIP must also provide for the following:

- Procedures for using monitoring data and other information in a State with mandatory Class I areas to determine the contribution of emissions from within the State to regional haze visibility impairment at Class I areas both within and outside the State;
- Procedures for using monitoring data and other information in a State with no mandatory Class I areas to determine the contribution of emissions from within the State to regional haze visibility impairment at Class I areas in other States;
- Reporting of all visibility monitoring data to the Administrator at least annually for each Class I area in the State, and where possible, in electronic format;
- Developing a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. A State must also make a commitment to update the inventory periodically; and
- Other elements, including reporting, recordkeeping, and other measures necessary to assess and report on visibility.

Forty CFR 51.308(f) of the RHR requires control strategies to cover an initial implementation period extending to the year 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter. Periodic SIP revisions must meet the core requirements of 40 CFR 51.308(d) with the exception of BART. The BART provisions of 40 CFR 51.308(e), as noted above, apply only to the first implementation period. Periodic SIP

revisions will assure that the statutory requirement of reasonable progress will continue to be met.

H. Consultation with States and Federal Land Managers (FLMs)

The RHR requires that States consult with FLMs before adopting and submitting their SIPs. See 40 CFR 51.308(i). States must provide FLMs an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on the SIP. This consultation must include the opportunity for the FLMs to discuss their assessment of impairment of visibility in any Class I area and to offer recommendations on the development of the RPGs and on the development and implementation of strategies to address visibility impairment. Further, a State must include in its SIP a description of how it addressed any comments provided by the FLMs. Finally, a SIP must provide procedures for continuing consultation between the State and FLMs regarding the State's visibility protection program, including development and review of SIP revisions, five-year progress reports, and the implementation of other programs having the potential to contribute to impairment of visibility in Class I areas.

III. What is EPA's Analysis of New Hampshire's Regional Haze SIP Submittal?

On January 29, 2010, NHDES's Air Resources Division submitted revisions to the New Hampshire SIP to address regional haze as required by 40 CFR 51.308. Amended SIP revisions were submitted on January 14, 2011, and August 26, 2011. EPA has reviewed New Hampshire's submittals and is proposing to find that it is consistent with the requirements of 40 CFR 51.308 as outlined in Section II. A detailed analysis follows.

New Hampshire is responsible for developing a regional haze SIP which addresses visibility in New Hampshire's two Class I areas. These areas are the Great Gulf Wilderness and the Presidential Range – Dry River Wilderness, both located within the White Mountains National Forest. The State must also address New Hampshire's impact on any other nearby Class I areas.

A. New Hampshire's Affected Class I Areas

New Hampshire is home to two Class I areas: (1) Great Gulf Wilderness Area (Great Gulf); and (2) Presidential Range – Dry River Wilderness Area (Dry River).

In addition to these areas, the MANE-VU RPO contains five other Class I areas in three States: Lye Brook Wilderness Area in Vermont; Acadia National Park, Moosehorn Wilderness Area and Roosevelt Campobello International Park in Maine; and the Brigantine Wilderness Area in New Jersey.

The New Hampshire regional haze SIP establishes RPGs for visibility improvement at its Class I areas and a LTS to achieve those RPGs within the first regional haze implementation period ending in 2018. In developing the RPG for each Class I area, New Hampshire considered both emission sources inside and outside of New Hampshire that may cause or contribute to visibility impairment in New Hampshire's Class I area. The State also identified and considered emission sources within New Hampshire that may cause or contribute to visibility impairment in Class I areas in neighboring States as required by 40 CFR 51.308(d)(3). The MANE-VU RPO worked with the State in developing the technical analyses used to make these determinations, including

State-by-State contributions to visibility impairment in specific Class I areas, which included the two areas in New Hampshire and those areas affected by emissions from New Hampshire.

B. Determination of Baseline, Natural and Current Visibility Conditions

As required by the RHR and in accordance with EPA's 2003 Natural Visibility Guidance, New Hampshire calculated baseline/current and natural conditions for its Class I areas.

1. Estimating Natural Visibility Conditions

Natural background refers to visibility conditions that existed before human activities affected air quality in the region. The national goal, as set out in the Clean Air Act, is a return to natural visibility conditions.

Estimates of natural visibility conditions are based on annual average concentrations of fine particle components. The IMPROVE[4] equation is a formula for estimating light extinction from species measured by the IMPROVE monitors. As documented in EPA's 2003 Natural Visibility Guidance, EPA determined, with concurrence from the IMPROVE Steering Committee, that States may use a "refined approach" to the then current IMPROVE formula to estimate the values that characterize the natural visibility conditions of the Class I areas. The purpose of the refinement to the "old IMPROVE equation" is to provide more accurate estimates of the various factors that affect the calculation of light extinction. The new IMPROVE equation takes into

[4] The Interagency Monitoring of Protected Visual Environments (IMPROVE) program is a cooperative measurement effort governed by a steering committee composed of representatives from Federal (including representatives from EPA and the FLMs) and RPOs. The IMPROVE monitoring program was established in 1985 to aid the creation of Federal and State implementation plans for the protection of visibility in Class I areas. One of the objectives of IMPROVE is to identify chemical species and emission sources responsible for existing man-made visibility impairment. The IMPROVE program has also been a key participant in visibility-related research, including the advancement of monitoring instrumentation, analysis techniques, visibility modeling, policy formulation and source attribution field studies.

account the most recent review of the science[5] and accounts for the effect of particle size distribution on light extinction efficiency of sulfate, nitrate, and organic carbon. It also adjusts the mass multiplier for organic carbon (particulate organic matter) by increasing it from 1.4 to 1.8. New terms are added to the equation to account for light extinction by sea salt and light absorption by gaseous nitrogen dioxide. Site-specific values are used for Rayleigh scattering (scattering of light due to atmospheric gases) to account for the site-specific effects of elevation and temperature. Separate relative humidity enhancement factors are used for small and large size distributions of ammonium sulfate and ammonium nitrate and for sea salt. The terms for the remaining contributors, elemental carbon (light-absorbing carbon), fine soil, and coarse mass terms, do not change between the original and new IMPROVE equations. New Hampshire opted to use this refined approach, referred to as the "new IMPROVE equation," for its two areas.

Natural visibility conditions using the new IMPROVE equation were calculated separately for each Class I area by MANE-VU. EPA is proposing to find that the best and worst 20 percent natural visibility values for Great Gulf and Dry River (shown in Table 1) were calculated using the EPA guidelines.

2. Estimating Baseline Conditions

[5] The science behind the revised IMPROVE equation is summarized in numerous published papers. *See, eg.*, J. L. Hand & W. C. Malm**,** *Review of the IMPROVE Equation for Estimating Ambient Light Extinction Coefficients - Final Report*, March 2006 (Interagency Monitoring of Protected Visual Environments (IMPROVE), Colorado State University, Cooperative Institute for Research in the Atmosphere, Fort Collins, CO), available at http://vista.cira.colostate.edu/improve/publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm; Marc Pitchford, *Natural Haze Levels II: Application of the New IMPROVE Alogrithm to Natural Species Concentrations Estimates: Final Report of the Natural Haze Levels II Committee to the RPO Monitoring/Data Analysis Workgroup*, Sept. 2006, available at http://vista.cira.colostate.edu/improve/Publications/GrayLit/029_NaturalCondII/naturalhazelevelsIIreport.ppt.

Great Gulf and Dry River do not contain an IMPROVE monitor. In cases where onsite monitoring is not available, 40 CFR 51.308(d)(2)(i) requires States to use the most representative monitoring available for the 2000-2004 period to establish baseline visibility conditions, in consultation with EPA. New Hampshire used, and EPA concurs with the use of, 2000-2004 data from the IMPROVE monitor located at Camp Dodge in Pinkham Notch, New Hampshire as representative of Great Gulf and Dry River. The Camp Dodge IMPROVE monitor is adjacent to the Great Gulf area.

As explained in Section II.B, for the first regional haze SIP, baseline visibility conditions are the same as current conditions. A five-year average of the 2000-2004 monitoring data was calculated for each of the 20 percent worst and 20 percent best visibility days for Great Gulf and Dry River. IMPROVE data records for the period 2000-2004 meet the EPA requirements for data completeness. See page 2-8 of EPA's 2003 Tracking Progress Guidance.

3. Summary of Baseline and Natural Conditions

For the New Hampshire Class I areas, baseline visibility conditions on the 20 percent worst days are 22.8 deciviews at Great Gulf and Dry River. Natural visibility conditions for these areas are estimated to be 12.0 dv on the 20 percent worst visibility days. The natural and background conditions for Great Gulf and Dry River for both the 20 percent worst and 20 percent best days are presented in Table 1 below.

Table 1 - Natural Background and Baseline Conditions for Great Gulf and Dry River

Class I Areas	2000 – 2004 Baseline (dv)		Natural Conditions (dv)	
	Worst 20%	Best 20%	Worst 20%	Best 20%
Great Gulf and Dry River	22.8	7.7	12.0	3.7

4. Uniform Rate of Progress

In setting the RPGs, New Hampshire considered the uniform rate of progress needed to reach natural visibility conditions by 2064 ("glide path") and the emission reduction measures needed to achieve that rate of progress over the period of the SIP to meet the requirements of 40 CFR 51.308(d)(1)(i)(B). As explained in EPA's Reasonable Progress Guidance document, the uniform rate of progress is not a presumptive target, and RPGs may be greater, lesser, or equivalent to the glide path.

For Great Gulf and Dry River, the overall visibility improvement necessary to reach natural conditions is the difference between the baseline visibility of 22.8 dv and natural background visibility of 12.0 dv, or an improvement of 10.8 dv for the 20 percent worst visibility days. New Hampshire must also ensure no degradation in visibility for the best 20 percent visibility days over the same period in accordance with 40 CFR 51.308(d)(1).

New Hampshire's SIP submittal presents two graphs, one for the 20 percent best days, and one for the 20 percent worst days, for its Class I areas. New Hampshire constructed the graphs for the worst days (i.e., the glide path) in accordance with EPA's 2003 Tracking Progress Guidance by plotting a straight graphical line from the baseline level of visibility impairment for 2000-2004 to the level of natural visibility conditions in 2064. For the best days, the graph includes a horizontal, straight line spanning from baseline conditions in 2004 out to 2018 to depict no degradation in visibility over the implementation period of the SIP. New Hampshire's SIP shows that the State's RPG for its Class I areas provide for improvement in visibility for the 20

percent worst days over the period of the implementation plan and ensure no degradation in visibility for the 20 percent best visibility days over the same period in accordance with 40 CFR 51.308(d)(1).

C. Reasonable Progress Goals

As a State containing two Class I areas, 40 CFR 51.308(d)(1) of the RHR requires New Hampshire to develop the reasonable progress goals for visibility improvement during the first planning period.

1. Relative Contributions of Pollutants to Visibility Impairment

An important step toward identifying reasonable progress measures is to identify the key pollutants contributing to visibility impairment at each Class I area. To understand the relative benefit of further reducing emissions from different pollutants, MANE-VU developed emission sensitivity model runs using EPA's Community Multiscale Air Quality (CMAQ) air quality model[6] to evaluate visibility and air quality impacts from various groups of emissions and pollutant scenarios in the Class I areas on the 20 percent worst visibility days.

Regarding which pollutants are most significantly impacting visibility in the MANE-VU region, MANE-VU's contribution assessment demonstrated that sulfate is the major contributor to $PM_{2.5}$ mass and visibility impairment at Class I areas in the Northeast and Mid-Atlantic

[6] CMAQ is a photochemical grid model. The model uses simulations of chemical reactions, emissions of $PM_{2.5}$ and $PM_{2.5}$ precursors, and the Pennsylvania State University/ National Center for Atmospheric Research Mesoscale Meteorological Model to produce speciated $PM_{2.5}$ concentrations. For more information, see www.epa.gov/asmdnerl/CMAQ/cmaq_model.html

Region.[7] Sulfate particles commonly account for more than 50 percent of particle-related light extinction at northeastern Class I areas on the clearest days and for as much as, or more than, 80 percent on the haziest days. For example, at the Brigantine National Wildlife Refuge Class I area (the MANE-VU Class I area with the greatest visibility impairment), on the 20 percent worst visibility days in 2000 through 2004, sulfate accounted for 66 percent of the particle extinction. After sulfate, organic carbon (OC) consistently accounts for the next largest fraction of light extinction. Organic carbon accounted for 13 percent of light extinction on the 20 percent worst visibility days for Brigantine, followed by nitrate that accounts for 9 percent of light extinction.

The emissions sensitivity analyses conducted by MANE-VU predict that reductions in SO_2 emissions from EGU and non-EGU industrial point sources will result in the greatest improvements in visibility in the Class I areas in the MANE-VU region, more than any other visibility-impairing pollutant. As a result of the dominant role of sulfate in the formation of regional haze in the Northeast and Mid-Atlantic Region, MANE-VU concluded that an effective emissions management approach would rely heavily on broad-based regional SO_2 control efforts in the eastern United States.

Through source apportionment modeling, MANE-VU assisted States in determining their contribution to the visibility impairment of each Class I area in the MANE-VU region. New Hampshire and the other MANE-VU States adopted a weight-of-evidence approach which relied on several independent methods for assessing the contribution of different sources and

[7] See the NESCAUM Document "Regional Haze and Visibility in the Northeast and Mid-Atlantic States," January 31, 2001.

geographic source regions to regional haze in the northeastern and mid-Atlantic portions of the United States. Details about each technique can be found in the NESCAUM Document *Contributions to Regional Haze in the Northeast and Mid-Atlantic United States,* August 2006 (hereinafter referred to as "Contribution Report").[8]

The MANE-VU Class I States determined that any State contributing at least 2% of the total sulfate observed on the 20 percent worst visibility days in 2002 were contributors to visibility impairment at the Class I area. Connecticut, Rhode Island, Vermont, and the District of Columbia were determined to contribute less than 2% of sulfate at any of the Northeast Class I areas. States found to contribute 2% or more of the sulfate at any of the MANE-VU Class I areas were: Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.

The contribution of New Hampshire emissions to the total sulfate was determined to contribute to the visibility impairment in not only the New Hampshire Class I areas (3.95% of total sulfate), but Acadia National Park in Maine as well (2.25% of total sulfate). The impact of sulfate on visibility is discussed in greater detail below.

EPA is proposing to find that NHDES has adequately demonstrated that emissions from New Hampshire sources contribute to visibility impairment in nearby Class I Areas.

2. Procedure for Identifying Sources to Evaluate for Reasonable Progress Controls

[8] This document has been provided as part of the docket to this proposed rulemaking.

In developing the 2018 reasonable progress goal, New Hampshire relied primarily upon the information and analysis developed by MANE-VU to meet this requirement. Based on the Contribution Report, MANE-VU focused on SO_2 as the dominant contributor to visibility impairment at all MANE-VU Class I areas during all seasons. In addition, the Contribution Report found that only 25 percent of the sulfate at the MANE-VU Class I areas originate in the MANE-VU States. Sources in the Midwest and Southeast regions were responsible for 15 to 25 percent, respectively. Point sources dominated the inventory of SO_2 emissions. Therefore, MANE-VU's strategy includes additional measures to control sources of SO_2 both within the MANE-VU region and in other States that were determined to contribute to regional haze at the MANE-VU Class I Areas.

Based on information from the Contribution Report and additional emission inventory analysis, MANE-VU and New Hampshire identified the following source categories for further examination for reasonable controls:

- Coal and oil-fired Electrical Generating Units (EGUs);
- Point and area source industrial, commercial and institutional boilers;
- Cement and Lime Kilns;
- Heating Oil; and
- Residential wood combustion.

MANE-VU analyzed these sources categories as potential sources of emission reductions for making reasonable progress based on the "four statutory factors" according to 40 CFR 51.308(d)(3)(V).

3. Application of the Four Clean Air Act Factors in the Reasonable Progress Analysis

As discussed in Section II.C above, New Hampshire must consider the following factors in developing the RPGs: (1) the cost of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. MANE-VU's four factor analysis can be found in "*Assessment of Reasonable Progress for Regional Haze in MANE-VU Class I Areas*," July 9, 2007, otherwise known as the Reasonable Progress Report.[9]

New Hampshire and the other MANE-VU States reviewed the Reasonable Progress Report, consulted with one another about possible control measures, and agreed to the following measures as recommended strategies for making reasonable progress: implementation of BART requirements; a 90 percent reduction in SO_2 emissions from 167 EGU emission points[10] (or if it is infeasible to achieve that level of reduction from a unit, alternative measures will be pursued in such State); and a low sulfur fuel oil strategy. These measures are collectively known as the MANE-VU "Ask."

MANE-VU used model projections to calculate the RPG for the Class I areas in the MANE-VU region. The projected improvement in visibility due to emission reductions expected by the end of the first period, 2018, is shown in Table 2.

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[9] This report has been included as part of the docket for this rulemaking.

[10] MANE-VU identified these 167 units based on source apportionment modeling using two different meteorological data sets. From each of the modeling runs, MANE-VU identified the top 100 units which contribute to visibility impairment. Differences in model output resulted in a total of 167 units being identified for further control.

Table 2 - Projected Reasonable Progress Goal and Uniform Rate of Progress (URP) for New Hampshire Class I Areas from NESCAUM 2018 Visibility Projections in Deciviews

Class I Areas		2000 – 2004 Baseline	2018 CMAQ	URP	Natural Background
Great Gulf and Dry River	20% Worst Visibility Days	22.8	19.23	20.3	12.0
	20% Best Visibility Days	7.7	7.2	-	3.7

At the time of MANE-VU modeling (discussed in further detail in Section III.E.2), some of the other States with sources potentially impacting visibility, in the Class I areas in both New Hampshire and the rest of the MANE-VU domain, had not yet made final control determinations for BART, and thus, these controls are not included in the modeling prepared by MANE-VU and used by New Hampshire. This is a conservative approach because additional emission reductions could result from the application of BART controls. The modeling conducted by MANE-VU demonstrates that the 2018 control scenario (2018 projection) provides for an improvement in visibility greater than the uniform rate of progress for the New Hampshire Class I areas for the most impaired days over the period of the implementation plan and ensures no degradation in visibility for the least impaired days over the same period.

Consistent with EPA guidance at the time, the MANE-VU modeling included reductions from the Clean Air Interstate Rule (CAIR) in estimating the RPGs for 2018. The regional haze provisions specify that a State may not adopt a RPG that represents less visibility improvement than is expected to result from other CAA requirements during the implementation period. See 40 CFR 51.308(d)(1)(vi). Therefore, in estimating the RPGs for 2018, many States took into account emission reductions anticipated from CAIR. MANE-VU initially reduced emissions from highest impacting 167 EGUs by ninety percent. However, many of the units targeted for the

90% reduction were part of the CAIR program. Since the 90% reduction was larger, in total tons of emissions reduced, than the reductions expected from CAIR, MANE-VU added the excess emissions back into the inventory to account for trading of the emission credits across the modeling domain. This way, MANE-VU States would not overestimate the emission reductions or the related visibility improvement if States used the CAIR program as their response to the MANE-VU's “Ask” of ninety percent reduction from the 167 EGUs in the eastern United States.

The RPGs for Great Gulf and Dry River in New Hampshire are based on modeled projections of future emissions that were developed using the best available information at the time the analysis was completed. While MANE-VU's emission inventory used for modeling included estimates of future emission growth, projections can change as additional information regarding future conditions becomes available. It would be both impractical and resource-intensive to require a State to continually adjust the RPG every time an event affecting these future projections changed. EPA recognized the problems of a rigid requirement to meet a long-term goal based on modeled projections of future visibility conditions, and addressed the uncertainties associated with RPGs in several ways. EPA made clear in the RHR that the RPG is not a mandatory standard which must be achieved by a particular date. See 64 FR 35733. At the same time, EPA established a requirement for a five-year, midcourse review and, if necessary, correction of the States' regional haze plans. See 40 CFR 52.308(g). In particular, the RHR calls for a five-year progress review after submittal of the initial regional haze plan. The purpose of this progress review is to assess the effectiveness of emission management strategies in meeting the RPG and to provide an assessment of whether current implementation strategies are

sufficient for the State or affected States to meet their RPGs. If a State concludes, based on its assessment, that the RPGs for a Class I area will not be met, the RHR requires the State to take appropriate action. See 40 CFR 52.308(h). The nature of the appropriate action will depend on the basis for the State's conclusion that the current strategies are insufficient to meet the RPGs. In its SIP submittal, New Hampshire commits to the midcourse review and submitting revisions to the regional haze plan where necessary. Therefore, EPA is proposing to approve New Hampshire's RPG for the first regional haze planning period irrespective of the status of CAIR and irrespective of the associated issues regarding the adequacy of other State's plans. For similar reasons, EPA believes the approvability of the New Hampshire plan is not affected by the status of the Cross State Air Pollution Rule, which was promulgated on August 8, 2011 (76 FR 48208), and stayed on December 30, 2011. (EME Homer City Generation, L.P. v. EPA, Civ. No. 11-1302, slip op. (D.C. Cir. Dec. 30, 2011), available at www.epa.gov/airtransport/pdfs/CourtDecision.pdf.)

D. Best Available Retrofit Technology (BART)

1. Identification of All Bart Eligible Sources

Determining BART-eligible sources is the first step in the BART process. The New Hampshire BART-eligible sources were identified in accordance with the methodology in Appendix Y of the Regional Haze Rule, Guidelines for BART Determinations Under the Regional Haze Rule, Part II, How to Identify BART-Eligible Sources. See 70 FR 39158. This guidance consists of the following criteria:

- the unit falls into one of the listed source categories;
- the unit was constructed or reconstructed between 1962 and 1977; and

- the unit has the potential to emit over 250 tons per year of sulfur dioxide, nitrogen oxides, particulate matter, volatile organic compounds , or ammonia.

The BART Guidelines requires States to address SO_2, NO_x, and particulate matter. States are allowed to use their best judgment in deciding whether VOC or ammonia emissions from a source are likely to have an impact on visibility in the area. The State of New Hampshire addressed SO_2, NO_x, and used particulate matter less than 10 microns in diameter (PM_{10}) as an indicator for particulate matter to identify BART eligible units, as the BART Guidelines require. Consistent with the BART Guidelines, the State of New Hampshire did not evaluate emissions of VOCs and ammonia in BART determinations due to the lack of impact on visibility in the area due to anthropogenic sources. The majority of VOC emissions in New Hampshire are biogenic in nature, especially near the New Hampshire Class I areas. Therefore, the ability to further reduce total ambient VOC concentrations at Class I areas is limited. Point, area, and mobile sources of VOCs in New Hampshire are already comprehensively controlled as part of ozone attainment and maintenance strategy. In respect to ammonia, the overall ammonia inventory is very uncertain, but the amount of anthropogenic emissions at sources that were BART-eligible is relatively small, and no additional sources were identified that had greater than 250 tons per year ammonia and required a BART analysis.

The identification of BART sources in New Hampshire was undertaken as part of a multi-State analysis conducted by the Northeast States for Coordinated Air Use Management (NESCAUM). NESCAUM worked with NH DES licensing engineers to review all sources and determine their

BART eligibility. NH DES identified two sources as BART-eligible. These sources are listed below.

Table 3- BART-Eligible Sources in New Hampshire

Source and Unit	Location	BART Source Category	2002 Emissions (ton/yr)	Base Visibility Impact (dv)
PSNH - Merrimack Station, Unit MK2	Bow, NH	320 MW EGU	SO_2: 20,902 NOx: 2,871 PM: 210	Acadia NP: 2.25 Great Gulf: 1.81 Lye Brook: 0.61
PSNH - Newington Station, Unit NT1	Newington, NH	400 MW EGU	SO_2: 5,226 NOx: 943 PM: 338	Acadia NP: 1.22 Great Gulf: 0.99 Lye Brook: 0.28

2. Identification of Sources Subject to BART

New Hampshire, working with MANE-VU, found that every MANE-VU State with BART-eligible sources contributes to visibility impairment at one or more Class I areas to a significant degree (see the Contribution Report). According to Section III of the 2005 Regional Haze Rule, once the State has compiled its list of BART-eligible sources, it needs to determine whether to make BART determinations for all of the sources or to consider exempting some of them from BART because they may not reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area. Because both of the BART-eligible sources in New Hampshire contribute to visibility impairment to a significant degree, they are both subject to BART.

3. The New Hampshire BART Analysis Protocol

Forty CFR 51.308(e)(1)(ii)(A) requires that, for each BART-eligible source within the State, any BART determination must be based on an analysis of the best system of continuous emission control technology available and the associated emission reductions achievable. In addition to

considering available technologies, this analysis must evaluate five specific factors for each source: (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of visibility improvement which may reasonably be anticipated from the use of BART.

To address the fifth factor, the degree of visibility improvement which may be reasonably anticipated from the use of BART, NH DES conducted California Puff Model (CALPUFF) and CALGRID photochemical grid[11] modeling analyses to assess the visibility effects of BART controls for both PSNH Merrimack Station Unit MK2 and PSNH Newington Station Unit NT1. For theses analyses, NH DES ran the CALPUFF model for each unit under uncontrolled (current allowable) and controlled conditions (post-control scenarios being assessed). Results were tabulated for the average of the 20% worst natural visibility days at each nearby Class I area and the 20% worst baseline visibility modeled day at each nearby Class I area. For any pair of control levels evaluated, the difference in the level of impairment predicted is the degree of improvement in visibility expected.

4. Source Specific BART Determinations

The following section discusses the BART determinations for sources in New Hampshire.

a. Public Service of New Hampshire (PSNH) Merrimack Station

i. Background

[11] Additional detail regarding the CALPUFF and CALGRID modeling is provided in Attachment X- BART Analysis for Sources in New Hampshire of the SIP submittal.

PSNH Merrimack Station has two coal-fired steam-generating boilers. Only one of the boilers (MK2) is subject to BART, the other unit (MK1) was put into operation prior to 1962.

Unit MK2 is a wet bottom, cyclone-type boiler with a heat input rating of 3,473 MMBtu/hr and an electrical output of 320 MW. The unit is currently equipped with selective catalytic reduction (SCR) for NOx control, and two electrostatic precipitators (ESPs) operated in series to capture particulate matter (PM) in the flue gases.

ii. Boiler MK2

(1)PM BART Review: PM levels are currently controlled with two dry ESPs in combination with fly ash reinjection. These existing ESPs were previously upgraded to include state-of -the-art electronic controls. Adding a third ESP was found to be unreasonable due to space limitations. The current permit limit for this unit is 0.227 lb of total suspended particulate (TSP)/million british thermal unit (MMBtu). Limited stack tests indicate that the actually TSP emission rate is much lower, averaging 0.034 lb TSP/MMBtu. The NH DES model scenario of upgrading the current ESPs to 90% control resulted in a visibility improvement of 0.16 dv at Acadia, 0.12 dv at Great Gulf, and 0.03 dv at Lye Brook.

NH DES determined that the installation of addition PM controls are unlikely to result in substantial visibility improvement. However, based on the limited available stack test data, NH DES determined that the current emission limit of 0.227 lb/MMBtu was not reflective of the performance capabilities of the control equipment. The MANE-VU recommended particulate

matter limit for non-CAIR EGUs is 0.02 – 0.04 lb/MMBtu.[12] New Hampshire has adopted a new regulation[13] which places Units MK1 and MK2 within a regulatory "bubble" for the purposes of TSP compliance. The revised emission limit is 0.08 lb TSP/MMBtu for both Units MK1 and MK2. New Hampshire defined this level of control as BART.

(2) SO_2 BART Review: Emissions of SO_2 from MK2 are currently controlled by a fuel sulfur limit of 2.0 lb sulfur/MMBtu. The most stringent retrofit control technology for SO_2 controls is wet flue gas desulfurization (FGD). New Hampshire law requires the installation of a wet FGD for mercury removal[14] on unit MK1 and MK2. As a co-benefit, the FGD is required to achieve at least 90% SO_2 control. Because this installation is already mandated and the removal rate approaches the MANE-VU recommended limit of 95% for non-CAIR EGUs, New Hampshire determined that the BART SO_2 emission limit for this unit is at least 90% control. Current permit conditions require the facility to submit calendar monthly emission rates for the preceding 12 months by December 31, 2014. At that time, New Hampshire will determine the maximum sustainable rate of control. As specified by permit conditions, in no case may this rate be less than 90 % control. In addition, emissions from MK1 will also be controlled via the FGD.

(3) NO_x BART Review: PSNH currently operates SCR on MK2. It was installed in 1994 to meet other air quality requirements (ozone season NOx). Selective non-catalytic reduction (SNCR) is the only other post combustion control technology available for controlling NOx and

[12] The MANE-VU Workgroup Recommended level of BART control can be found in Attachment W – "MANE-VU Five-Factor Analysis of BART-eligible Sources" of the SIP submittal.
[13] Env-A 2300 Mitigation of Regional Haze, effective January 8, 2011.
[14] See NH RSA Chapter 125-I, Air Toxics Control Act (www.gencourt.state.nh.us/rsa/html/x/125-i/125-i-mrg.htm), and in NH Code of Administrative Rules Chapter Env-A 1400, Regulated Toxic Air Pollutants. (http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a1400.pdf)

is generally considered to be less effective. The existing SCR has received previous retrofits to improve performance. Additional upgrades would require major redesign and construction. Capital cost would be comparable to installing a new SCR and would achieve only marginal additional reduction. Because Unit MK2 has an existing SCR system and can operated year-round at reasonable cost, full time operation of the existing SCR was determined by New Hampshire to be BART for NOx control. In addition, New Hampshire reduced the permitted NOx emission limit from a 0.86 lb/MMBtu annual average to a 0.30 lb/MMBtu 30-day rolling average.

iii. EPA Assessment

For PM, New Hampshire decided to provide some level of flexibility to Merrimack Station which has a source subject to BART (MK2) and a source not subject to BART (MK1). If only MK1 operated, the emission limit required by New Hampshire would represent a decrease of 70.4 % from the MK1 emission limit of 0.27 lb/MMBtu. At worst, when only MK2 is operating, the emission limit represents a decrease of 64.8 % from the currently permitted limit of 0.227 lb/MMBtu. Additionally, the emission limit chosen by New Hampshire also results in a lower emission rate from the combined units than if New Hampshire had only required MK2 to meet the limit suggested by MANE-VU.[15] Therefore New Hampshire's proposed BART control limits for PM are reflective of the MANE-VU recommended limitation. Considering the current controls on emissions from Merrimack Station—two ESPs in series—as well as the reductions

[15] For the "bubble," the combined emission rate if both units are operating is 377 lb/hr:
0.08 lb/MMBtu x 4,711 MMBtu/hr = 377 lb/hr.
Without the "bubble," the sum of the individual emission rates applying MANE-VU's presumptive PM emission limit of 0.04 lb/MMBtu would be 473 lb/hr:
(0.04 lb/MMBtu x 3,473 MMBtu/hr) + (0.27 lb/MMBtu x 1,238 MMBtu/hr) = 473 lb/hr.
New Hampshire's approach therefore results in a decrease of almost 100 lb/hr beyond what application of the MANE-VU suggested limit would require.

guaranteed by New Hampshire's limits, EPA is proposing to find that New Hampshire's BART limits for PM at Merrimack Station are reasonable.

EPA is also proposing to find that New Hampshire's analyses and conclusions of BART emission limits for SO_2 and NO_X for units located at the Merrimack Station facility are reasonable. EPA has reviewed the New Hampshire analyses and concluded they were conducted in a manner consistent with the RHR and EPA's BART Guidelines.

b. PSNH Newington Station

i. Background

PSNH Newington is comprised of one 400 MW electrical generating unit, NT1. Unit NT1 is principally operated during periods of peak electrical demand. The unit is capable of burning oil and/or natural gas. However, because of physical limitations on the boiler's design, the unit can only operate up to 50 percent maximum heat input when firing only natural gas.

Current emission controls consist of: low-NOx burners, an overfire air system, and water injection for NOx control; a sulfur in fuel oil limit of 2.0% for SO_2 control; and an ESP for PM control.

ii. Boiler NT1

(1) PM BART Review: PM is currently controlled with an ESP. An ESP is considered the most stringent control available. The current permit limit is 0.22 lb TSP/MMBtu. A single available stack test yielded a controlled TSP emission rate in the vicinity of 0.06 lb TSP/MMBtu. The

facility's Title V operating permit requires a compliance stack test for PM emissions be performed and the permit limit to be amended, as appropriate, prior to March 31, 2012.

(2) SO_2 BART Review: SO_2 is currently controlled by a 2.0 % sulfur by weight fuel oil limit for No. 6 oil, a 0.4% sulfur by weight in fuel oil limit for No. 2 oil, and the use of natural gas. New Hampshire identified FGD, a 1.0% sulfur limit, a 0.5% sulfur limit, and 0.3% sulfur limit as feasible controls.

There is little experience with the cost data for installing flue gas desulfurization at oil-fired power plants. Using the FGD installation at Merrimack station as a guide, New Hampshire estimated that the capital cost would roughly be $422 million.[16]

New Hampshire analyzed switching from 2% sulfur by weight No. 6 oil to 1%, 0.7%, 0.5%, or 0.3% sulfur by weight No. 6 oil as potential BART controls. A summary of the cost, the expected visibility improvement at the highest visibility impacted Class I area—Acadia National Park, and the cumulative visibility improvement, are detailed in Table 4, below.

Table 4 - Increased Cost and Visibility Improvement Expected from Installation of SO2 Controls

% Sulfur	Increased cost/hr		$/ton SO_2 reduced		Visibility Improvement Acadia (dv)	Cumulative Visibility Improvement (dv)
	Low	High	Low	High		

[16] At this cost, conservatively assuming a 100% removal efficiency (NT1 emitted 5226 tons of SO_2 per year during the baseline period), the $/ton for FGD is approximately $80,750/ton. In addition, the 2005 NESCAUM report, "*Assessment of Control Options for BART-Eligible Sources*," www.nescaum.org/documents/bart-control-assessment.pdf/, estimated the cost of FGD for oil-fired units could be twice that of coal-fired units. EPA is proposing to find as reasonable New Hampshire's determination that the installation of FGD is cost prohibitive.

2% to 1%	$0.00	$2,993	0	$1,030	0.3	0.59
2% to 0.7%	$1,346	$4,712	$402	$1,407		
2% to 0.5%	$2,020	$6,059	$528	$1,583	0.46	0.89
2% to 0.3%	$2,693	$11,445	$627	$2,664	0.52	1.0

In addition to cost and expected visibility improvement, New Hampshire looked at other non-environmental impacts such as fuel availability, current fuel oil usage, and the existing inventory. While 0.5% sulfur by weight No. 6 fuel oil is widespread in northern New England, 0.3% sulfur by weight fuel oil is still very limited in availability. In addition, with recent utilization levels around 10% capacity, it is uncertain when NT1 will consume the existing supply of higher sulfur fuel oil stored on site.

New Hampshire has determined that an SO_2 emission limit of 0.5 lb SO_2/MMBtu is the appropriate level of BART control. This emission limit is comparable to requiring the use of 0.5% sulfur by weight No. 6 fuel oil while giving the facility flexibility to blend the existing fuel oil with natural gas.

(3) NO_x BART Review: NT1 currently operates low-NOx burners, an over-fire air system, and water injection to minimize NOx formation. The facility's existing permit limits NOx emission to a daily average of 0.35 lb/MMBtu when burning oil and 0.25 lb/MMBtu when burning a combination of oil and gas. Other potential NOx controls include SNCR and SCR. New Hampshire estimates the cost of control to be $1,030/ton and $1,180 ton for SNCR and SCR, respectively. The annualized cost is $0.7 million for SNCR and to $1.3 million for SCR.

However, both SNCR and SCR will increase ammonia emissions which can result in additional visibility impairment. Modeling indicates that the greatest expected visibility improvement from SCR is 0.34 dv at Acadia, with a cumulative potential improvement of 0.76 dv across three impacted Class I areas. New Hampshire determined that the current system of low-NOx burners, over-fire air, and water injection represents BART.

iii. EPA Assessment

EPA is proposing to find that New Hampshire's determination of PM BART controls for Newington Station is reasonable. ESP is considered the most stringent control technology and EPA assumes that the permit limit set after stack testing will reflect the fullest extent of reductions that the facility can meet with the use of the ESP.

While New Hampshire did not require the lowest sulfur content fuel potentially available, EPA believes that New Hampshire's consideration of additional factors, such as the limited availability of 0.3% sulfur No. 6 fuel oil and the limited additional improvement in visibility, is reasonable. Therefore EPA is proposing to approve New Hampshire's determination of SO_2 BART controls for Newington Station.

Finally, while the cost per ton for the installation of SNCR or SCR is likely not cost prohibitive, given the limited visibility improvement projected as compared to the current controls and with the limited use of the unit, EPA is proposing to find that New Hampshire's determination that current controls satisfy NO_X BART is reasonable.

5. Enforceability of BART

As part of New Hampshire's January 14, 2011 supplemental Regional Haze SIP submittal, NH DES included the newly adopted "Env-A 2300 Mitigation of Regional Haze" and the Merrimack Station temporary permitTP-0008, which detail emission limits, and recordkeeping and reporting requirements associated with the installation of the identified BART controls. EPA is proposing to approve the submitted rule and permit as part of this rulemaking action. If finalized, as proposed, these conditions will become federally enforceable.

E. Long-Term Strategy (LTS)

As described in Section II.E of this action, the LTS is a compilation of State-specific control measures relied on by the State to obtain its share of emission reductions to support the RPGs established by Maine, New Hampshire, Vermont, and New Jersey (the nearby Class I area States). New Hampshire's LTS for the first implementation period addresses the emissions reductions from federal, State, and local controls that take effect in the State from the baseline period starting in 2002 until 2018. New Hampshire participated in the MANE-VU regional strategy development process. As a participant, New Hampshire supported a regional approach towards deciding which control measures to pursue for regional haze, which was based on technical analyses documented in the following reports: a) the MANE-VU Contribution Report; b) the Reasonable Progress Report c) *Five-Factor Analysis of BART-Eligible Sources: Survey of Options for Conducting BART Determinations*, available at www.nescaum.org/documents/bart-final-memo-06-28-07.pdf; and d) *Assessment of Control Technology Options for BART-Eligible Sources: Steam Electric Boilers, Industrial Boilers, Cement Plants and Paper, and Pulp Facilities*, available at www.nescaum.org/documents/bart-control-assessment.pdf.

The LTS was developed by New Hampshire, in coordination with MANE-VU, identifying the emissions units within New Hampshire that are currently likely to have the largest impacts on visibility at nearby Class I areas, estimating emissions reductions for 2018, based on all controls required under federal and State regulations for the 2002-2018 period (including BART), and comparing projected visibility improvement with the uniform rate of progress for the nearby Class I area.

New Hampshire's LTS includes measures needed to achieve its share of emissions reductions agreed upon through the consultation process with MANE-VU Class I States and includes enforceable emissions limitations, compliance schedules, and other measures necessary to achieve the reasonable progress goals established by Maine, Vermont and New Jersey for their Class I areas.

1. Emissions Inventory for 2018 with Federal and State Control Requirements

The State-wide emissions inventories used in the regional haze technical analyses were developed by MARAMA for MANE-VU with assistance from New Hampshire. The 2018 emissions inventory was developed by projecting 2002 emissions forward based on assumptions regarding emissions growth due to projected increases in economic activity and emission reductions expected from federal and State regulations. MANE-VU's emissions inventories included estimates of NOx, coarse particulate matter (PM_{10}), $PM_{2.5}$, and SO_2, VOC, and NH_3. . The BART Guidelines direct States to exercise judgment in deciding whether VOC and NH_3

impair visibility in their Class I area(s). As discussed further in Section III.C.1 above, MANE-VU demonstrated that anthropogenic emissions of sulfates are the major contributor to $PM_{2.5}$ mass and visibility impairment at Class I areas in the Northeast and Mid-Atlantic region. It was also determined that the total NH_3 emissions in the MANE-VU region are extremely small.

MANE-VU developed emissions inventories for four inventory source classifications: 1) stationary point sources; 2) stationary area sources; 3) non-road mobile sources; and 4) on-road mobile sources. The New York Department of Environmental Conservation also developed an inventory of biogenic emissions for the entire MANE-VU region. Stationary point sources are those sources that emit greater than a specified tonnage per year, depending on the pollutant, with data provided at the facility level. Stationary area sources are those sources whose individual emissions are relatively small, but due to the large number of these sources, the collective emissions from the source category could be significant. Non-road mobile sources are equipment that can move but do not use the roadways. On-road mobile source emissions are automobiles, trucks, and motorcycles that use the roadway system. The emissions from these sources are estimated by vehicle type and road type. Biogenic sources are natural sources like trees, crops, grasses, and natural decay of plants. Stationary point sources emission data is tracked at the facility level. For all other source types, emissions are summed on the county level.

There are many federal and State control programs being implemented that MANE-VU and New Hampshire anticipate will reduce emissions between the baseline period and 2018. Emission reductions from these control programs in the MANE-VU region were projected to

achieve substantial visibility improvement by 2018 at all of the MANE-VU Class I areas. To assess emissions reductions from ongoing air pollution control programs, BART, and reasonable progress measures, MANE-VU developed emissions projections for 2018 called "Best and Final." The emissions inventory provided by the State of New Hampshire for the "Best and Final" 2018 projections is based on expected control requirements.

New Hampshire relied on emission reductions from a number of ongoing and expected air pollution control programs as part of the State's long term strategy. For electrical generating units (EGUs), New Hampshire's Regulation Chapter Env-A 3200, NOx Budget Trading Program which limits ozone season NOx emissions on all fossil-fuel-fired EGUs greater than 15 MW to 0.15 lb/MMBtu. However, a unit can meet this limit via NOx credits.

New Hampshire also relied on the following controls on non-EGU point sources in estimating 2018 emissions inventories: 2-year, 4-year, 7-year, and 10-year Maximum Achievable Control Technology (MACT) Standards; Combustion Turbine and Reciprocating Internal Combustion Engine (RICE) MACT; and Industrial Boiler/Process Heater MACT.

On July 30, 2007, the U.S. District Court of Appeals mandated the vacatur and remand of the Industrial Boiler MACT Rule. *NRDC v. EPA*, 489F.3d 1250 (D.C. Cir. 2007). This MACT was vacated since it was directly affected by the vacatur and remand of the Commercial and Industrial Solid Waste Incinerator (CISWI) Definition Rule. EPA proposed a new Industrial Boiler MACT rule to address the vacatur on June 4, 2010, (75 FR 32006) and issued a final rule on March 21, 2011 (76 FR 15608). On May 18, 2011, EPA stayed the effective date of the

Industrial Boiler MACT pending review by the D.C. Circuit or the completion of EPA's reconsideration of the rule. See 76 FR 28662.

On December 2, 2011, EPA issued a proposed reconsideration of the MACT standards for existing and new Boilers at major (76 FR 80598) and area (76 FR 80532) source facilities, and for Commercial and Industrial Solid Waste Incinerators (76 FR 80452). On January 9, 2012, the U.S. District Court for the District of Columbia vacated EPA's stay of the effectiveness date of the Industrial Boiler MACT, reinstating the original effective date and therefore requiring compliance with the current rule in 2014. *Sierra Club v. Jackson*, Civ. No. 11-1278, slip op. (D.D.C. Jan. 9, 2012).

Even though New Hampshire's modeling is based on the old Industrial Boiler MACT limits, New Hampshire modeling conclusions are unlikely to be affected because the expected reductions in SO_2 and PM resulting from the new MACT are small relative to the New Hampshire inventory. Therefore, EPA is proposing to find that the expected reductions of the new rule are acceptable since the final rule requires compliance by 2014. This provides New Hampshire time to assure the required controls are in place prior to the end of the first implementation period in 2018. In addition, the RHR requires that any resulting differences between emissions projections and actual emissions reductions that may occur will be addressed during the five-year review prior to the next 2018 regional haze SIP.

Controls on area sources expected in 2018 include VOC control for consumer products (Env-A 4100), architectural and industrial maintenance coatings (Env-A 4200), portable fuel containers (Env-A 4000), and solvent cleaning (Env-A 1221).

Controls on mobile sources expected in 2018 include: Stage I vapor recovery systems at gasoline dispensing facilities in the State and Stage II vapor recovery at any gasoline dispensing facility in the four southern counties classified as ozone nonattainment areas (Rockingham, Strafford, Hillsborough, and Merrimack) (Env-A 1205, later re-numbered to Env-Wm 1404);[17] Federal On-Board Refueling Vapor Recovery (ORVR) Rule; Federal Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Requirements; Federal Heavy-Duty Diesel Engine Emission Standards for Trucks and Buses; and Federal Emission Standards for Large Industrial Spark-Ignition Engines and Recreation Vehicles.

Controls on non-road sources expected by 2018 include the following federal regulations: Control of Air Pollution: Determination of Significance for Nonroad Sources and Emission Standards for New Nonroad Compression Ignition Engines at or above 37 kilowatts (59 FR 31306, (June 17, 1994)); Control of Emissions of Air Pollution from Nonroad Diesel Engines (63 FR 56967, (October 23, 1998)); Control of Emissions from Nonroad Large Spark-Ignition Engines and Recreational Engines (67 FR 68241, (November 8, 2002)); and Control of

[17] New Hampshire recently revised Env-Wm 1404 to no longer require Stage II vapor recovery controls as of January 1, 2012. The previous version of the rule, however, is still currently included in the New Hampshire SIP. New Hampshire DES is currently developing a SIP submittal for the revised rule which would ensure that Clean Air Act antibacksliding requirements are met. The SIP submittal must provide for equivalent or greater reductions than under the currently approved Stage II program. Therefore, consideration of these reductions in the model is reasonable.

Emissions of Air Pollution from Nonroad Diesel Engines and Fuels (69 FR 38958, (June 29, 2004)).

Tables 5 and 6 are summaries of the 2002 baseline and 2018 estimated emissions inventories for New Hampshire. The 2018 estimated emissions include emissions growth as well as emission reductions due to ongoing emission control strategies and reasonable progress goals.

Table 5 - 2002 Emission Inventory Summary for New Hampshire (tons per year)

	VOC	NOx	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Point	1,599	9,759	3,332	2,938	46,560	74
Area	65,370	10,960	43,328	17,532	7,072	2,158
On-Road Mobile	16,762	33,283	814	562	777	1,447
Non-Road Mobile	22,376	9,912	1,058	965	891	9
Biogenics	141,894	482	0	0	0	0
Total	248,001	64,396	48,532	21,997	55,300	3,688

Table 6 - 2018 Emissions Inventory Summary for New Hampshire (tons per year)

	VOC	NOx	PM_{10}	$PM_{2.5}$	SO_2[18]	NH_3
Point	1,291	4,258	3,397	3,208	13,880	184
Area	62,649	12,180	21,775	14,993	7,421	2,2789
On-Road Mobile	6,564	7,671	282	263	537	1,916
Non-Road Mobile	15,003	6,344	697	634	246	11
Biogenics	141,894	482	0	0	0	0
Total	227,401	30,935	26,151[19]	19,098	22,084	4,900

2. Modeling to Support the LTS and Determine Visibility Improvement for Uniform Rate of Progress

[18] The 2018 SO_2 Emission Inventroy has been adjusted to account for the lack of a low sulfur fuel oil strategy. The State had estimated that the low sulfur fuel oil strategy would result in an SO_2 reduction of 6,449 tons from area sources and 2,030 ton reduction from non-EGU point sources.

[19] An adjustment factor was applied during the processing of emissions data to restate fugitive particulate matter emissions. Grid models have been found to overestimate fugitive dust impacts when compared with ambient samples; therefore, an adjustment is typically applied to account for the removal of particles by vegetation and other terrain features. The summary emissions for PM_{10} in Table 6 reflect this adjustment. A comparable adjustment was not made to the PM_{10} value listed in Table 5.

MANE-VU performed modeling for the regional haze LTS for the 11 Mid-Atlantic and Northeast States and the District of Columbia. The modeling analysis is a complex technical evaluation that began with selection of the modeling system. MANE-VU used the following modeling system:

- Meteorological Model: The Fifth-Generation Pennsylvania State University/National Center for Atmospheric Research (NCAR) Mesoscale Meteorological Model (MM5) version 3.6 is a nonhydrostatic, prognostic meteorological model routinely used for urban- and regional-scale photochemical, $PM_{2.5}$, and regional haze regulatory modeling studies.
- Emissions Model: The Sparse Matrix Operator Kernel Emissions (SMOKE) version 2.1 modeling system is an emissions modeling system that generates hourly gridded speciated emission inputs of mobile, non-road mobile, area, point, fire, and biogenic emission sources for photochemical grid models.
- Air Quality Model: The EPA's Models-3/Community Multiscale Air Quality (CMAQ) version 4.5.1 is a photochemical grid model capable of addressing ozone, PM, visibility and acid deposition at a regional scale.
- Air Quality Model: The Regional Model for Aerosols and Deposition (REMSAD), is a Eulerian grid model that was primarily used to determine the attribution of sulfate species in the Eastern US via the species-tagging scheme.
- Air Quality Model: The California Puff Model (CALPUFF), version 5 is a non-steady-state Lagrangian puff model used to access the contribution of individual States' emissions to sulfate levels at selected Class I receptor sites.

CMAQ modeling of regional haze in the MANE-VU region for 2002 and 2018 was carried out on a grid of 12x12 kilometer (km) cells that covers the 11 MANE-VU States (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) and the District of Columbia and States adjacent to them. This grid is nested within a larger national CMAQ modeling grid of 36x36 km grid cells that covers the continental United States, portions of Canada and Mexico, and portions of the Atlantic and Pacific Oceans along the east and west coasts. Selection of a representative period of meteorology is crucial for evaluating baseline air quality conditions and projecting future changes in air quality due to changes in emissions of visibility-impairing pollutants. MANE-VU conducted an in-depth analysis which resulted in the selection of the entire year of 2002 (January 1-December 31) as the best period of meteorology available for conducting the CMAQ modeling. The MANE-VU States' modeling was developed consistent with EPA's *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze,* April 2007 (EPA-454/B-07-002), available at www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf, and EPA document, *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations*, August 2005 and updated November 2005 (EPA-454/R-05-001), available at www.epa.gov/ttnchie1/eidocs/eiguid/index.html (hereinafter referred to as " EPA's Modeling Guidance*").*

MANE-VU examined the model performance of the regional modeling for the areas of interest before determining whether the CMAQ model results were suitable for use in the regional haze

assessment of the LTS and for use in the modeling assessment. The modeling assessment predicts future levels of emissions and visibility impairment used to support the LTS and to compare predicted, modeled visibility levels with those on the uniform rate of progress. In keeping with the objective of the CMAQ modeling platform, the air quality model performance was evaluated using graphical and statistical assessments based on measured ozone, fine particles, and acid deposition from various monitoring networks and databases for the 2002 base year. MANE-VU used a diverse set of statistical parameters from the EPA's Modeling Guidance to stress and examine the model and modeling inputs. Once MANE-VU determined the model performance to be acceptable, MANE-VU used the model to assess the 2018 RPGs using the current and future year air quality modeling predictions, and compared the RPGs to the uniform rate of progress.

In accordance with 40 CFR 51.308(d)(3), the State of New Hampshire provided the appropriate supporting documentation for all required analyses used to determine the State's LTS. The technical analyses and modeling used to develop the glide path and to support the LTS are consistent with EPA's RHR, and interim and final EPA Modeling Guidance. EPA is proposing to find that the MANE-VU technical modeling to support the LTS and determine visibility improvement for the uniform rate of progress is acceptable because the modeling system was chosen and used according to EPA Modeling Guidance. EPA agrees with the MANE-VU model performance procedures and results, and that the CMAQ is an appropriate tool for the regional haze assessments for the New Hampshire LTS and regional haze SIP.

2. Meeting the MANE-VU "Ask"

New Hampshire is home to two Class I areas, therefore it is required to establish RPGs. New Hampshire, in cooperation with the MANE-VU States, developed the MANE-VU "Ask" that will provide for reasonable progress towards achieving natural visibility at the MANE-VU Class I area. The "Ask" consists of: (a) timely implementation of BART requirements; (b) a 90 percent reduction in SO_2 emissions from each of the EGU stacks identified by MANE-VU comprising a total of 167 stacks; (c) adoption of a low sulfur fuel oil strategy; and (d) continued evaluation of other control measures to reduce SO_2 and NO_x emissions.

a. Timely Implementation of BART

The New Hampshire BART determinations are discussed in detail in Section III.D. As previously noted, EPA is proposing to find that the BART determinations for Merrimack Station Unit MK2 and Newington Station NT1 are reasonable.

b. Ninety Percent Reduction in SO_2 emissions from each of the EGU stacks identified by MANE-VU comprising a total of 167 stacks

New Hampshire has three EGU stacks identified by MANE-VU as a top contributor to visibility impairment in any of the MANE-VU Class I areas: MK1 and MK2 at Merrimack Station; and NT1 at Newington Station.

Merrimack Station is installing a wet flue gas desulfurization system on MK1 and MK2 which will reduce SO_2 emissions by at least 90 %. Permit conditions require the facility to submit calendar monthly emission rates for the preceding 12 months by December 31, 2014. At that time, New Hampshire will determine the maximum sustainable rate of control. As specified by

current permit conditions, in no case may this rate be less than 90 % control. It is expected that the level of control will approach 95 %. The New Hampshire BART determination for Newington Station NT1 is an SO_2 emission limit of 0.50 lb/MMBtu. This represents a 67 % reduction in SO_2 emission from NT1.

The combination of reductions from the three identified stacks results in at least an overall 87 % reduction in SO_2 emissions, comparable to the MANE-VU projected 90 % reduction.

c. Continued evaluation of other control measures to reduce SO_2 and NO_x emissions including the MANE-VU low sulfur fuel oil strategy

The MANE-VU low sulfur fuel oil strategy includes: the Phase I reduction of distillate oil to 0.05% sulfur by weight (500 parts per million (ppm)) by no later than 2014; and the Phase II reductions of #4 residual oil to 0.25% sulfur by weight by no later than 2018; #6 residual oil to 0.5% sulfur by weight by no later than 2018; and further reduce the sulfur content of distillate oil to 15 ppm by 2018.

The reduction in SO_2 emissions from this low-sulfur fuel oil strategy by 2018 will yield corresponding reductions in sulfate aerosol, the main culprit in fine-particle pollution and regional haze. The MANE-VU analysis demonstrates that the reduction of the sulfur content in fuel oil will lead to an average reduction of 0.13 – 0.18 ug/m^3 in the 24 hour $PM_{2.5}$ concentration within New Hampshire, improving health and local visibility. In addition, the use of low sulfur fuels will result in cost savings to owners/operators of residential furnaces and boilers due to reduced maintenance costs and extended life of the units.

In its August 26, 2011 submittal, New Hampshire committed to the "[c]ontinued evaluation of other possible control measures for haze-causing emissions, including participation in MANE-VU's low sulfur fuel oil strategy by 2018." While New Hampshire has not yet submitted a federally enforceable low sulfur fuel oil strategy, in addition to previously discussed SO_2 reductions, SO_2 emissions in New Hampshire have been reduced through the conversion of coal-fired Unit 5 at Schiller Station to a biomass-firing unit and the shutdown of Fraser LLC pulp and paper mill.[20]

EPA is proposing approval of the New Hampshire Regional Haze SIP for the first implementation period without inclusion of an adopted low sulfur fuel oil regulation.[21] While the additional reductions are somewhat less than the reductions projected to result from adoption of a low-sulfur fuel oil strategy, this shortfall is not anticipated to interfere with the ability of New Hampshire and the other Class I States to meet their respective reasonable progress goals. We encourage adoption of a low-sulfur fuel oil strategy by New Hampshire as such a strategy will have local air quality and some, limited visibility benefits, however, we do not believe it is a necessary component of an approvable Regional Haze SIP for New Hampshire for the first implementation period.

[20] The annual 2002 SO_2 emissions from Schiller Station Unit 5 and Fraser LLC were 2,796 tons and 638 tons, respectively.

[21] On January 15, 2009, EPA made a finding that, among other States, New Hampshire had failed to submit a Regional Haze SIP by the required deadline. 74 FR 2392. We have proposed a consent decree to resolve a deadline suit regarding this finding as well as the finding of failure for 36 other States, the District of Columbia, and the U.S. Virgin Islands. National Parks Conservation Association v. Jackson, Civ. No. 1:11-cv-1548 (D.D.C. 2011). Because we do not believe a low-sulfur fuel oil strategy is necessary for New Hampshire during this first implementation period, EPA is moving forward with this proposed approval of the State's SIP submittal in order to satisfy our obligations under the Clean Air Act.

EPA also notes that implementation of recent federal measures, such as the Mercury and Air Toxics Standards (MATS) and the revised one hour SO_2 standard, is expected to result in further SO_2 emission reductions during the first planning period. Although expected emission reductions cannot be relied upon to demonstrate that New Hampshire has obtained its share of the emission reductions needed to meet the RPG for the area, once these measures are implemented and the reductions quantified, EPA expects that New Hampshire's overall SO_2 emission reductions will exceed those agreed to in the RPO process.

3. Additional Considerations for the LTS

Forty CFR 51.308(d)(3)(v) requires States to consider the following factors in developing the long term strategy:

- Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment;
- Measures to mitigate the impacts of construction activities;
- Emission limitations and schedules for compliance to achieve the reasonable progress goal;
- Source retirement and replacement schedules;
- Smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the State for these purposes;
- Enforceability of emissions limitations and control measures; and
- The anticipated net effect on visibility due to projected changes in point area, and mobile source emissions over the period addressed by the long term strategy.

a. Emission reductions including RAVI

No source in New Hampshire has been identified as subject to RAVI. A list of New Hampshire's ongoing air pollution control programs is included in Section III.E.1.

b. Construction activities

The Regional Haze Rule requires New Hampshire to consider measures to mitigate the impacts of construction activities on regional haze. MANE-VU's consideration of control measures for construction activities is documented in "*Technical Support Document on Measures to Mitigate the Visibility Impacts of Construction Activities in the MANE-VU Region*," Draft, October 20, 2006.[22]

The construction industry is already subject to requirements for controlling pollutants that contribute to visibility impairment. For example, federal regulations require the reduction of SO_2 emissions from construction vehicles. At the State level, New Hampshire currently regulates emissions of fugitive dust through New Hampshire's Code of Administrative Rules Env-A 1002, Fugitive Dust, which requires the control of direct emissions of particulate matter from mining, transportation, storage, use, and removal activities.

MANE-VU's Contribution Report found that, from a regional haze perspective, crustal material generally does not play a major role. On the 20 percent best-visibility days during the 2000-2004 baseline period, crustal material accounted for 6 to 11 percent of the particle-related light extinction at the MANE-VU Class I Areas. On the 20 percent worst-visibility days, however, the contribution was reduced to 2 to 3 percent. Furthermore, the crustal fraction is

[22] This document has been provided as part of the docket to this proposed rulemaking.

largely made up of pollutants of natural origin (e.g., soil or sea salt) that are not targeted under the Regional Haze Rule. Nevertheless, the crustal fraction at any given location can be heavily influenced by the proximity of construction activities; and construction activities occurring in the immediate vicinity of MANE-VU Class I area could have a noticeable effect on visibility.

For this regional haze SIP, New Hampshire concluded that its current regulations are currently sufficient to mitigate the impacts of construction activities. Any future deliberations on potential control measures for construction activities and the possible implementation will be documented in the first regional haze SIP progress report. EPA is proposing to find that New Hampshire has adequately addressed measures to mitigate the impacts of construction activities.

c. Emission limitations and schedules for compliance to achieve the RPG

In addition to the existing CAA control requirements discussed in Section III.E.1, New Hampshire has adopted and submitted regulation Env-A 2300 Mitigation of Regional Haze to EPA as a SIP revision. This rule establishes SO_2, NOx and PM emission limits for Merrimack Station units MK1 and MK2 and Newington Station NT1. EPA is proposing to approve this rule as part of today's action.

d. Source retirement and replacement schedule

Forty CFR 51.308(d)(3)(v)(D) of the Regional Haze Rule requires New Hampshire to consider source retirement and replacement schedules in developing the long term strategy. Source retirement and replacement were considered in developing the 2018 emissions. The following

sources in New Hampshire were shut down (or replaced) after the 2002 base year and therefore were not included in the 2018 inventory:

- PSNH Schiller Station Unit No. 5 replacement (Portsmouth, NH),
- Groveton Paperboard, Inc. (Groveton, NH), and
- Wausau Paper Printing & Writing, LLC (Groveton, NH).

Since the 2002 and 2018 inventories were developed, Fraser N.H. LLC (Berlin, NH) also shut down.

EPA is proposing to determine that New Hampshire has satisfactorily considered source retirement and replacement schedules as part of the LTS.

e. Smoke management techniques

The Regional Haze Rule requires States to consider smoke management techniques related to agricultural and forestry management in developing the long-term strategy. MANE-VU's analysis of smoke management in the context of regional haze is documented in "*Technical Support Document on Agricultural and Smoke Management in the MANE-VU Region*," September 1, 2006.[23]

New Hampshire does not currently have a Smoke Management Program (SMP). However, SMPs are required only when smoke impacts from fires managed for resources benefits contribute significantly to regional haze. The emissions inventory presented in the above-cited document indicates that agricultural, managed and prescribed burning emissions are very minor; the inventory estimates that, in New Hampshire, those emissions from those source categories

[23] This document has been included as part of the docket to this proposed rulemaking.

totaled 498.5 tons of PM_{10}, 427.6 tons of $PM_{2.5}$ and 30.1 tons of SO_2 in 2002, which constitute 1.0%, 1.9% and 0.05% of the total inventory for these pollutants, respectively.

Source apportionment results show that wood smoke is a moderate contributor to visibility impairment at some Class I areas in the MANE-VU region; however, smoke is not a large contributor to haze in MANE-VU Class I areas on either the 20% best or 20% worst visibility days. Moreover, most of wood smoke is attributable to residential wood combustion. Therefore, it is unlikely that fires for agricultural or forestry management cause large impacts on visibility in any of the Class I areas in the MANE-VU region. On rare occasions, smoke from major fires degrades air quality and visibility in the MANE-VU area. However, these fires are generally unwanted wildfires that are not subject to SMPs. Therefore, a SMP is not required for New Hampshire. EPA proposes to approve New Hampshire's decision that an Agricultural and Forestry Smoke Management Plan to address visibility impairment is not required at this time.

f. Enforceability of emission limitations and control measures.

All emission limitations included as part of New Hampshire's Regional Haze SIP are either currently federally enforceable or will become federally enforceable if this action is finalized as proposed. EPA is proposing to find that New Hampshire has adequately addressed the enforceability of emission limitations and control measures.

g. The anticipated net effect on visibility

As explained above, New Hampshire has not adopted the low sulfur fuel oil strategy included in the MANE-VU "Ask." However, through implementation of BART and the targeted EGU

strategy, New Hampshire will achieve a greater than 60 % reduction in statewide SO_2 emissions. New Hampshire and EPA anticipate that the Class I areas impacted by New Hampshire will attain the visibility improvement expected for the first planning period.

In summary, EPA is proposing to find that New Hampshire's Regional Haze SIP meets, or is comparable to, the MANE-VU Ask, that the controls proposed in the SIP are reasonable for the LTS for the first implementation period, and that New Hampshire adequately addressed all the requirements of a LTS contained in the RHR.

F. Consultation with States and Federal Land Managers (FLMs)

On May 10, 2006, the MANE-VU State Air Directors adopted the Inter-RPO State/Tribal and FLM Consultation Framework that documented the consultation process within the context of regional phase planning, and was intended to create greater certainty and understanding among RPOs. MANE-VU States held ten consultation meetings and/or conference calls from March 1, 2007, through March 21, 2008. In addition to MANE-VU members attending these meetings and conference calls, participants from the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) RPO, Midwest RPO, and the relevant Federal Land Managers were also in attendance. In addition to the conference calls and meeting, the FLMs were given the opportunity to review and comment on each of the technical documents developed by MANE-VU.

On August 1, 2008, New Hampshire submitted a draft Regional Haze SIP to the relevant FLMs for review and comment pursuant to 40 CFR 51.308(i)(2). The FLMs provided comments on the

draft Regional Haze SIP in accordance with 40 CFR 51.308(i)(3). The comments received from the FLMs were addressed and incorporated in New Hampshire's SIP revision. Most of the comments were requests for additional detail as to various aspects of the SIP. These comments and New Hampshire's response to comments can be found in the docket for this proposed rulemaking.

On May 25, 2009, New Hampshire published a notice of agency rulemaking proposal. This initiated a 30-day comment period and a public hearing on June 24, 2009. On November 19, 2010, New Hampshire published a second notice of agency rulemaking proposal. This initiated a 30-day comment period and a public hearing on December 20, 2010. NHDES received comments from EPA, the Federal Land Managers, Appalachian Mountain Club, and Sierra Club. New Hampshire's response to comments is included as an attachment to the SIP submittal.

To address the requirement for continuing consultation procedures with the FLMs under 40 CFR 51.308(i)(4), New Hampshire commits in their SIP to ongoing consultation with the FLMs periodically and as circumstances require, on the following implementation items:

- Status of emission strategies identified in the SIP as contributing to improvements in the worst-day visibility;
- Summary of major new source permits issued;
- Status of New Hampshire's actions toward completing any future assessments or rulemakings on source identified as probable contributors to visibility impairment, but not directly addressed in the most recent SIP revision;

- Any changes to the monitoring strategy or status of monitoring stations that might affect tracking of reasonable progress;
- Work underway for preparing the 5-year SIP review and/or 10-year SIP revision, including any items where the FLM's consideration or support is requested; and
- Summary of topics discussed in ongoing communications (e.g. meetings, emails, etc.) between New Hampshire and the FLMs regarding implementation of the visibility improvement program.

EPA proposes to find that New Hampshire has addressed the requirements for consultation with States impacting New Hampshire's Class I areas and with the Federal Land Managers.

G. Monitoring Strategy and Other Implementation Plan Requirements

Forty CFR 51.308(d)(4) of the Regional Haze Rule requires a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment that is representative of all mandatory Class I Areas within the State of New Hampshire. The monitoring strategy relies upon participation in the IMPROVE network.

The State of New Hampshire participates in the IMPROVE network, and will evaluate the monitoring network periodically and make those changes needed to be able to assess whether reasonable progress goals are being achieved in each of New Hampshire's mandatory Class I Areas. In its SIP submittal, New Hampshire is committing to continued support of the IMPROVE network.

Forty CFR 51.308(d)(4)(i) requires States to establish additional monitoring sites or equipment as needed to assess whether reasonable progress goals are being achieved toward visibility improvement at mandatory Class I areas. At this time, the current monitors are sufficient to make this assessment.

In its SIP submittal, New Hampshire commits to meet the requirements under 40 CFR 51.308(d)(4)(iv) to report to EPA visibility data for each of New Hampshire's Class I Areas annually.

The Regional Haze Rule (40 CFR 51.308(d)(4)(vi)) requires the inclusion of other monitoring elements, including reporting, recordkeeping, and other measures, necessary to assess and report visibility. While the State of New Hampshire has concluded that the current IMPROVE network provides sufficient data to adequately measure and report progress toward the goals set for the MANE-VU Class I sites to which the State contributes, the State has also found additional monitoring information useful to assess visibility and fine particle pollution in the region in the past. Examples of these data include results from: the MANE-VU Regional Aerosol Intensive Network (RAIN), which provides continuous, speciated information on rural aerosol characteristics and visibility parameters; the EPA Clean Air Status and Trends Network (CASTNET), which has provided complementary rural fine particle speciation data at non-class I sites; the EPA Speciation Trends Network (STN), which provides speciated, urban fine particle data to help develop a comprehensive picture of local and regional sources; state-operated rural and urban speciation sites using IMPROVE or STN methods; and the Supersites program, which has provided information through special studies that generally expands the understanding of the

processes that control fine particle formation and transport in the region. New Hampshire plans to continue to utilize these and other data -- as they are available and fiscal realities allow -- to improve their understanding of visibility impairment and to document progress toward reasonable progress goals under the Regional Haze Rule.

H. Periodic SIP Revisions and Five-Year Progress Reports

Consistent with the requirements of 40 CFR 51.308(g), New Hampshire has committed to submitting a report on reasonable progress (in the form of a SIP revision) to the EPA every five years following the initial submittal of its regional haze SIP. The reasonable progress report will evaluate the progress made towards the RPGs for the MANE-VU Class I areas, located in Maine, New Hampshire, Vermont, and New Jersey**.**

Forty CFR 51.308(f) requires New Hampshire to submit periodic revisions to its Regional Haze SIP by July 31, 2018, and every ten years thereafter. New Hampshire acknowledges and agrees to comply with this schedule.

Pursuant to 40 CFR 51.308(d)(4)(v), NHDES will also make periodic updates to the New Hampshire emissions inventory. NHDES plans to complete these updates to coincide with the progress reports. Actual emissions will be compared to projected modeled emissions in the progress reports.

Lastly, pursuant to 40 CFR 51.308(h), NHDES will submit a determination of adequacy of its regional haze SIP revision whenever a progress report is submitted. New Hampshire's regional

haze SIP states that, depending on the findings of its five-year review, New Hampshire will take one or more of the following actions at that time, whichever actions are appropriate or necessary:

- If New Hampshire determines that the existing State Implementation Plan requires no further substantive revision in order to achieve established goals for visibility improvement and emissions reductions, NHDES will provide to the EPA Administrator a negative declaration that further revision of the existing plan is not needed.
- If New Hampshire determines that its implementation plan is, or may be, inadequate to ensure reasonable progress as a result of emissions from sources in one or more other State(s) which participated in the regional planning process, NHDES will provide notification to the EPA Administrator and to those other State(s). New Hampshire will also collaborate with the other State(s) through the regional planning process for the purpose of developing additional strategies to address any such deficiencies in New Hampshire's plan.
- If New Hampshire determines that its implementation plan is, or may be, inadequate to ensure reasonable progress as a result of emissions from sources in another country, NHDES will provide notification, along with available information, to the EPA Administrator.
- If New Hampshire determines that the implementation plan is, or may be, inadequate to ensure reasonable progress as a result of emissions from sources within the State, NHDES will revise its implementation plan to address the plan's deficiencies within one year from this determination.

IV. What Action is EPA Proposing to Take?

EPA is proposing to approve New Hampshire's January 29, 2010 Regional Haze SIP revision, amended January 14, 2011, and August 26, 2011, as meeting the applicable implementing regulations found in 40 CFR 51.308. EPA is also proposing to approve, and incorporate into the New Hampshire SIP, New Hampshire's regulation Env-A 2300 Mitigation of Regional Haze and PSNH Merrimack Station Temporary Permit TP-0008 Flue Gas Desulfurization System dated March 9, 2009, and reissued August 2, 2010, and July 8, 2011.

V. Statutory and Executive Order Reviews

Under the Clean Air Act, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve State choices, provided that they meet the criteria of the Clean Air Act. Accordingly, this proposed action merely approves State law as meeting Federal requirements and does not impose additional requirements beyond those imposed by State law. For that reason, this proposed action:

- is not a "significant regulatory action" subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);
- does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);

- does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the Clean Air Act; and
- does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the State, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Carbon monoxide, Incorporation by reference, Intergovernmental relations, Lead, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

AUTHORITY: 42 U.S.C. 7401 et seq.

Dated: February 15, 2012

Signed: H. Curtis Spalding,
Regional Administrator,
EPA Region 1.

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