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40 CFR Part 52

Approval and Promulgation of Implementation Plans; State of Hawaii; Regional Haze Federal Implementation Plan; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R09–OAR–2012–0345, FRL–9675–3]

Approval and Promulgation of Implementation Plans; State of Hawaii; Regional Haze Federal Implementation Plan

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to promulgate a Federal Implementation Plan (FIP) to address regional haze in the State of Hawaii. EPA proposes to determine that the FIP meets the requirements of the Clean Air Act (CAA or ''the Act'') and EPA's rules concerning reasonable progress towards the national goal of preventing any future and remedying any existing man-made impairment of visibility in mandatory Class I areas. We are taking comments on this proposal and plan to follow with a final action.

DATES: Written comments must be received at the address below on or before July 2, 2012.

ADDRESSES: See Supplementary Information section for further instructions on where and how to learn more about this proposal, attend a public hearing or submit comments.

FOR FURTHER INFORMATION CONTACT: Gregory Nudd, Air Planning Office (AIR–2), U.S. Environmental Protection Agency Region 9, 415–947–4107, *nudd.gregory@epa.gov.*

SUPPLEMENTARY INFORMATION:

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I. General Information

A. Definitions

For the purpose of this document, we are giving meaning to certain words or initials as follows:

i. The words or initials *Act* or *CAA* mean or refer to the Clean Air Act, unless the context indicates otherwise.

ii. The initials b_{ext} mean or refer to total light extinction.

iii. The initials *CBI* mean or refer to Confidential Business Information.

iv. The initials *DOH* refer to the Hawaii Department of Health.

v. The initials *dv* mean or refer to deciview(s).

vi. The initials *EGU* mean or refer to Electric Generating Units.

vii. The words *EPA, we, us* or *our* mean or refer to the United States Environmental Protection Agency.

viii. The initials *FIP* mean or refer to Federal Implementation Plan.

ix. The initials *FLMs* mean or refer to Federal Land Managers.

x. The words *Hawaii* and *State* mean or refer to the State of Hawaii.

xi. The initials *HECO* mean or refer to the Hawaiian Electric Company.

xii. The initials *HELCO* mean or refer to the Hawaii Electric Light Company.

xiii. The initials *IMPROVE* mean or refer to Interagency Monitoring of Protected Visual Environments monitoring network.
xiv. The initials *IPM* mean or refer to Integrated Planning Model.
xv. The initials *LTS* mean or refer to Long-Term Strategy.
xvi. The initials *MECO* mean or refer to Maui Electric Company.
xvii. The initials *MW* mean or refer to megawatt(s).
xviii. The initials *NEI* mean or refer to National Emissions Inventory.
xix. The initials NH_3 mean or refer to ammonia.
xx. The initials NO_X mean or refer to nitrogen oxides.
xxi. The initials *NP* mean or refer to National Park.
xxii. The initials *OC* mean or refer to organic carbon.
xxiii. The initials *PM* mean or refer to particulate matter.
xxiv. The initials $PM_{2.5}$ mean or refer to particulate matter with an aerodynamic diameter of less than 2.5 micrometers (fine particulate matter).
xxv. The initials PM_{10} mean or refer to particulate matter with an aerodynamic diameter of less than 10 micrometers (coarse particulate matter).
xxvi. The initials *ppm* mean or refer to parts per million.
xxvii. The initials *PSD* mean or refer to Prevention of Significant Deterioration.
xxviii. The initials *RAVI* mean or refer to Reasonably Attributable Visibility Impairment.
xxix. The initials *RP* mean or refer to Reasonable Progress.
xxx. The initials *RPG* or *RPGs* mean or refer to Reasonable Progress Goal(s).
xxxi. The initials *RPOs* mean or refer to regional planning organizations.
xxxii. The initials *SIP* mean or refer to State Implementation Plan.
xxxiii. The initials SO_2 mean or refer to sulfur dioxide.
x. The initials *tpy* mean or refer to tons per year.
xi. The initials *TSD* mean or refer to Technical Support Document.
xii. The initials *URP* mean or refer to Uniform Rate of Progress.
xiii. The initials *VOC* mean or refer to volatile organic compounds.
xiv. The initials *WEP* mean or refer to Weighted Emissions Potential.
xv. The initials *WRAP* mean or refer to the Western Regional Air Partnership.

B. Docket

Data, information, and documents on which this proposed FIP relies have been placed in the docket for this action (docket number EPA–R09–OAR–2012–0345). All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available (e.g., Confidential Business Information (CBI)). Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically at *http://www.regulations.gov* or in hard copy at the Planning Office of the Air Division, Air–2, EPA Region 9, 75 Hawthorne Street, San Francisco, CA 94105. EPA requests you contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section to view the hard copy of the docket. You may view the hard copy of the docket Monday through Friday, 9:00–5:30 PST, excluding Federal holidays.

C. Instructions for Submitting Comments to EPA

Submit your comments, identified by Docket ID No. EPA–R09–OAR–2012–0345 by one of the following methods:
1. *Federal Rulemaking portal: http://www.regulations.gov.* Follow the on-line instructions for submitting comments.
2. *Email: nudd.gregory@epa.gov.*
3. *Fax:* 415–947–3579 (Attention: Gregory Nudd).
4. *Mail, Hand Delivery or Courier:* Gregory Nudd, EPA Region 9, Air Planning Office (AIR–2), Air Division, 75 Hawthorne Street, San Francisco, California 94105. Hand and courier deliveries are only accepted Monday through Friday, 8:30 a.m.–4:30 p.m., excluding Federal holidays. Special arrangements should be made for deliveries of boxed information.

EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or email. The *http://www.regulations.gov* Web site 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 email comment directly to EPA, without going through *http://www.regulations.gov,* your email 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.

D. Submitting CBI

Do not submit CBI to EPA through *http://www.regulations.gov* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

E. Tips for Preparing Your Comments

When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- Make sure to submit your comments by the comment period deadline identified.

F. Public Hearings

As announced on May 11, 2012, 77 FR 27671, EPA will hold two public hearings at the following dates, times and locations to accept oral and written comments into the record:

Date: May 31, 2012.
Time: Open House: 5:30–6:30 p.m.
Public Hearing 6:30–8:30 p.m.
Location: The University of Hawaii, Maui College in the Pilina Multipurpose Room, 310 W. Kaahumanu Avenue, Kahului, Hawaii 96732.
Date: June 1, 2012.
Time: Open House: 4:30–5:30 p.m.
Public Hearing: 5:30–7:30 p.m.

Location: Waiakea High School Cafeteria, 155 W. Kawili Street, Hilo, Hawaii 96720.

To provide opportunities for questions and discussion, EPA will hold open houses prior to the public hearings. During these open houses, EPA staff will be available to informally answer questions on our proposed action. Any comments made to EPA staff during the open houses must still be provided formally in writing or orally during a public hearing in order to be considered in the record.

The public hearings will provide the public with an opportunity to present data, views, or arguments concerning the proposed Regional Haze FIP for Hawaii. EPA may ask clarifying questions during the oral presentations, but will not respond to the presentations at that time. Written statements and supporting information submitted during the comment period will be considered with the same weight as any oral comments and supporting information presented at the public hearing. Please consult sections I.C, I.D. and I.E of this preamble for guidance on how to submit written comments to EPA.

At the public hearing, the hearing officer may limit the time available for each commenter to address the proposal to five minutes or less if the hearing officer determines it is appropriate. Any person may provide written or oral comments and data pertaining to our proposal at the public hearing. We will include verbatim transcripts, in English, of the hearing and written statements in the rulemaking docket.

II. Background

A. General Description of Regional Haze

Regional haze is visibility impairment produced by a multitude of sources and activities that are located across a broad geographic area and emit fine particulates ($PM_{2.5}$) (e.g., sulfates, nitrates, organic carbon (OC), elemental carbon (EC), and soil dust), and their precursors (e.g., sulfur dioxide (SO_2), nitrogen oxides (NO_X), and in some cases, ammonia (NH_3) and volatile organic compounds (VOC)). Fine particle precursors react in the atmosphere to form $PM_{2.5}$, which impairs 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 and eutrophication.

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 Parks (NPs) and wilderness areas (WAs). The average visual range [1] in many Class I areas (*i.e.,* NPs and memorial parks, WAs, 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 anthropogenic 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. 64 FR 35715 (July 1, 1999).

B. Visibility Protection Requirements of the CAA and EPA's Regulations

In section 169A of the 1977 Amendments to the CAA, Congress created a program for protecting visibility in the nation's NPs 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 [2] which impairment results from man-made 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.'' 45 FR 80084 (December 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.

As part of the 1990 Amendments to the CAA, Congress added section 169B to focus attention on regional haze issues. EPA promulgated a rule to address regional haze on July 1, 1999. 64 FR 35714 (July 1, 1999), codified at 40 CFR part 51, subpart P (Regional Haze Rule). The primary regulatory requirements that address regional haze are found at 40 CFR 51.308 and 51.309 and are summarized below. Under 40 CFR 51.308(b), all states, the District of Columbia and the Virgin Islands are required to submit an initial state implementation plan (SIP) addressing regional haze visibility impairment no later than December 17, 2007.[3]

C. Requirements for Regional Haze Implementation Plans

The Regional Haze Rule (RHR) sets out specific requirements for states' initial regional haze implementation plans. In particular, each state's plan must establish a long-term strategy that ensures reasonable progress (RP) toward achieving natural visibility conditions in each Class I area affected by the emissions from sources within the state. In addition, for each Class I area within the state's boundaries, the plan must establish a reasonable progress goal (RPG) for the first planning period that ends on July 31, 2018. The long-term strategy must include enforceable emission limits and other measures as necessary to achieve the RPG. Regional haze 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. These sources, where appropriate, are required to install Best Available Retrofit Technology (BART) controls to eliminate or reduce visibility impairment. The specific regional haze plan requirements are summarized below.

1. 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 expressed in deciviews is determined by using air quality measurements to estimate light extinction and then

[1] Visual range is the greatest distance, in kilometers or miles, at which a dark object can be viewed against the sky.

[2] Areas designated as mandatory Class I Federal areas consist of NPs 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.'' 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.''

[3] EPA's regional haze regulations require subsequent updates to the regional haze SIPs. 40 CFR 51.308(g)–(i).

transforming the value of light extinction to deciviews using a logarithmic function. The deciview is a more useful measure for tracking progress in improving visibility than light extinction because each deciview change is an equal incremental change in visibility as perceived by the human eye.[4]

The deciview is used to express reasonable progress goals, define visibility conditions and track changes in visibility. To track changes in visibility at each of the 156 Class I areas covered by the visibility program (40 CFR 81.401–437), and as part of the process for determining reasonable progress, states must calculate the degree of existing visibility impairment at each Class I area and periodically review progress midway through each ten-year implementation 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 develop an estimate of natural visibility conditions for the purpose 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.[5]

For the first regional haze SIPs that were due by December 17, 2007, ''baseline visibility conditions'' are the starting points for assessing ''current'' visibility impairment. Baseline visibility conditions represent the degree of visibility impairment for the 20 percent least impaired days and 20 percent most impaired days for each calendar year from 2000 to 2004. Using monitoring data for 2000 through 2004, states are required to calculate the average degree of visibility impairment for each Class I area, 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. In general, the 2000–2004 baseline period is considered the time from which improvement in visibility is measured.

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

[5] See ''Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule (September 2003) and ''Guidance for Tracking Progress Under the Regional Haze Rule (September 2003) for further information.

2. Determination of Reasonable Progress Goals

The vehicle for ensuring continuing progress towards achieving the natural visibility goal is the submission of a series of regional haze SIPs that establish two RPGs (*i.e.,* two distinct goals, one for the ''best'' and one for the ''worst'' days) for every Class I area for each (approximately) ten-year implementation 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. In setting RPGs, states must provide for an improvement in visibility for the most impaired days over the (approximately) ten-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 section 169A of the CAA and in EPA's RHR at 40 CFR 51.308(d)(1)(i)(A): (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. States have considerable flexibility in how they take these factors into consideration, as noted in EPA's Guidance for Setting Reasonable Progress Goals under the Regional Haze Program (June 1, 2007) (pp. 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'' (URP) or the ''glide path'') and the emission reduction measures needed to achieve that rate of progress over the ten-year period of the SIP. Uniform progress towards achievement of natural conditions by the year 2064 represents a rate of progress that 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 affecting visibility impairment at the Class I state's areas. 40 CFR 51.308(d)(1)(iv).

3. Best Available Retrofit Technology

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, section 169A(b)(2)(A) of 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 major stationary sources[6] built between 1962 and 1977 procure, install, and operate the ''Best Available Retrofit Technology'' as determined by the state. Under the RHR, states are directed to conduct BART determinations for such ''BART-eligible'' 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 such ''subject-to-BART'' source. States are required to use the approach set forth in the BART Guidelines in making a BART determination for fossil fuel-fired electric generating plants with a total generating capacity in excess of 750 megawatts. States are 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 SO_2, NO_X and PM. EPA has indicated that states should use their best judgment in determining whether VOC or NH_3 compounds impair visibility in Class I areas.

In their SIPs, states must identify potential BART sources, described in the RHR as ''BART-eligible sources.'' 40 CFR 51.308(e)(1)(i). A BART-eligible

[6] The set of ''major stationary sources'' potentially subject to BART is listed in CAA section 169A(g)(7).

source is an existing stationary source in any of 26 listed categories which meets criteria for startup dates and potential emissions. See 40 CFR 51.301 and 40 CFR part 51, Appendix Y, § II. Each BART-eligible source that ''emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area'' is subject to BART. 40 CFR 51.308(e)(1)(ii).

The BART Guidelines allow states to 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 Guidelines provide that:

> A single source that is responsible for a 1.0 deciview change or more should be considered to ''cause'' visibility impairment; a source that causes less than a 1.0 deciview change may still contribute to visibility impairment and thus be subject to BART. Because of varying circumstances affecting different Class I areas, the appropriate threshold for determining whether a source ''contributes to any visibility impairment'' for the purposes of BART may reasonably differ across States. As a general matter, any threshold that you use for determining whether a source ''contributes'' to visibility impairment should not be higher than 0.5 deciviews.

40 CFR part 51, Appendix Y, § III.A.1. The state must document its 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 is subject to BART and must therefore undergo a BART control analysis.

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 assigned to each factor, but all five factors must be considered. The BART Guidelines provide further detail about how to analyze these factors.

Once a state has made its BART determination, the BART controls must be installed and operated as expeditiously as practicable, but no later than five years after the date EPA approves the regional haze SIP. CAA section 169(g)(4), 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.

4. Long-Term Strategy

Consistent with the requirement in section 169A(b) of the CAA that states include in their regional haze SIP a ten- to fifteen-year strategy for making reasonable progress, section 51.308(d)(3) of the RHR requires that states include a long-term strategy (LTS) in their regional haze SIPs. The LTS is the compilation of all control measures a state will use during the implementation period of the specific SIP submittal to meet applicable RPGs. The LTS must include ''enforceable emissions limitations, compliance schedules, and other measures needed to achieve the reasonable progress goals'' for all Class I areas within and affected by emissions from the state. 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 downwind state to coordinate with contributing states to develop coordinated emissions management strategies. 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.

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 following seven factors listed below are 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; and, (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. 40 CFR 51.308(d)(3)(v).

5. Coordination of the Regional Haze SIP and Reasonably Attributable Visibility Impairment

As part of the RHR, EPA revised 40 CFR 51.306(c) regarding the long-term strategy 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 RAVI and regional haze, and the state must submit the first such coordinated LTS with its first regional haze SIP. Future coordinated LTSs, 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 review of a state's LTS must report on both regional haze and RAVI impairment and must be submitted to EPA as a SIP revision.

6. Monitoring Strategy

Section 51.308(d)(4) of the RHR requires a monitoring strategy for measuring, characterizing, and reporting on regional haze visibility impairment that is representative of all mandatory Class I 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 Interagency Monitoring of Protected Visual Environments (IMPROVE) network, *i.e.,* review and use of monitoring data from the 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.

7. SIP Revisions and Progress Reports

The RHR requires control strategies to cover an initial implementation period through 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every ten years thereafter. Periodic SIP revisions must meet the core requirements of section 51.308(d) with the exception of BART. The requirement to evaluate sources for BART applies only to the first regional haze SIP. Facilities subject to BART must continue to comply with the BART provisions of section 51.308(e), as noted above. Periodic SIP revisions will assure that the statutory requirement of reasonable progress will continue to be met.

Each state also is required to submit a report to EPA every five years that evaluates progress toward achieving the RPG for each Class I area within the state and outside the state if affected by emissions from within the state. 40 CFR 51.308(g). The first progress report is due five years from submittal of the initial regional haze SIP revision. At the same time a five-year progress report is submitted, a state must determine the adequacy of its existing SIP to achieve the established goals for visibility improvement. 40 CFR 51.308(h). The RHR contains more detailed requirements associated with these parts of the Rule.

8. Coordination With Federal Land Managers

The RHR requires that states consult with Federal Land Managers (FLMs) before adopting and submitting their SIPs. 40 CFR 51.308(i). States must provide FLMs an opportunity for consultation, in person and at least sixty 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. Furthermore, 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.

D. 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 particulate matter (PM) and other pollutants leading to regional haze.

The Western Regional Air Partnership (WRAP) 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 western United States. WRAP member State governments include: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. Tribal members include Campo Band of Kumeyaay Indians, Confederated Salish and Kootenai Tribes, Cortina Indian Rancheria, Hopi Tribe, Hualapai Nation of the Grand Canyon, Native Village of Shungnak, Nez Perce Tribe, Northern Cheyenne Tribe, Pueblo of Acoma, Pueblo of San Felipe, and Shoshone-Bannock Tribes of Fort Hall.

E. EPA's Authority To Promulgate a FIP

EPA made a finding of failure to submit on January 15, 2009 (74 FR 2392), determining that Hawaii failed to submit a SIP that addressed any of the required regional haze SIP elements of 40 CFR 51.308. Under section 110(c) of the Act, whenever we find that a State has failed to make a required submission we are required to promulgate a FIP. Specifically, section 110(c) provides:

(1) The Administrator shall promulgate a Federal implementation plan at any time within 2 years after the Administrator—

(A) finds that a State has failed to make a required submission or finds that the plan or plan revision submitted by the State does not satisfy the minimum criteria established under [section 110(k)(1)(A)], or

(B) disapproves a State implementation plan submission in whole or in part, unless the State corrects the deficiency, and the Administrator approves the plan or plan revision, before the Administrator promulgates such Federal implementation plan.

Section 302(y) defines the term ''Federal implementation plan'' in pertinent part, as:

[A] plan (or portion thereof) promulgated by the Administrator to fill all or a portion of a gap or otherwise correct all or a portion of an inadequacy in a State implementation plan, and which includes enforceable emission limitations or other control measures, means or techniques (including economic incentives, such as marketable permits or auctions or emissions allowances) * * *.

Thus, because we determined that Hawaii failed to submit a Regional Haze SIP, we are required to promulgate a Regional Haze FIP.

III. Proposed Implementation Plan To Address Regional Haze in Hawaii

A. Affected Class I Areas

In accordance with 40 CFR 51.308(d), we have identified two Class I areas within Hawaii: Hawaii Volcanoes NP on the Island of Hawaii, and Haleakala NP on the Island of Maui. EPA is responsible for developing RPGs for these two Class I areas. EPA has also determined that emissions from sources in Hawaii are not reasonably expected to have impacts at Class I areas in other states. See section III.G.1 below.

B. Baseline Visibility, Natural Visibility, and Uniform Rate of Progress

As required by section 51.308(d)(2)(i) of the Regional Haze Rule and in accordance with our 2003 Natural Visibility Guidance, EPA calculated baseline/current and natural visibility conditions for the two Hawaii Class I areas, Hawaii Volcanoes NP and Haleakala NP, on the most impaired and least impaired days, as summarized below.[7] The natural visibility conditions, baseline visibility conditions, and visibility impact reductions needed to achieve the Uniform Rate of Progress (URP) in 2018 for each of the two Hawaii Class I areas are presented in Table 1 and further explained in this section.

TABLE 1—VISIBILITY IMPACT REDUCTIONS NEEDED BASED ON BEST AND WORST DAYS BASELINES, NATURAL CONDITIONS, AND UNIFORM RATE OF PROGRESS FOR HAWAII CLASS I AREAS

Hawaii class I area	20% Worst days					20% Best days
	2001–2004 baseline (dv)	2018 URP (dv)	2018 Reduction needed (delta dv) [8]	2064 Natural conditions (dv)	2000–2004 Baseline (dv)	2064 Natural conditions (dv)
Hawaii Volcanoes NP	18.9	16.2	2.7	7.2	4.1	2.2
Haleakala NP	13.3	11.9	1.4	7.4	4.6	2.7

1. Estimating Natural Visibility Conditions

Natural background visibility, as defined in our 2003 Natural Visibility Guidance, is estimated by calculating the expected light extinction using default estimates of natural concentrations of fine particle components adjusted by site-specific estimates of humidity. This calculation uses the IMPROVE equation, which is a formula for estimating light extinction from the estimated natural concentrations of fine particle components (or from components measured by the IMPROVE monitors). As documented in our 2003 Natural Visibility Guidance,[9] EPA allows the use of ''refined'' or alternative approaches to this guidance to estimate the values that characterize the natural visibility conditions of Class I areas. One alternative approach is to develop and justify the use of alternative estimates of natural concentrations of fine particle components. Another alternative is to use the ''new IMPROVE equation'' that was adopted for use by the IMPROVE Steering Committee in December 2005 and the Natural Conditions II algorithm that was finalized in May 2007.[10] The purpose of this refinement to the ''old IMPROVE equation'' is to provide more accurate estimates of the various factors that affect the calculation of light extinction.

For the two Class I Areas in Hawaii, EPA opted to use WRAP calculations in which the default estimates for the natural conditions (see Table 2) were combined with the ''new IMPROVE equation'' and the Natural Conditions II algorithm (see Table 3). This is an acceptable approach under our 2003 Natural Visibility Guidance. Table 2 shows the default natural visibility values for the 20% worst days and 20% best days.

TABLE 2—DEFAULT NATURAL VISIBILITY VALUES FOR THE 20% BEST DAYS AND 20% WORST DAYS

Class I area	20% Worst days (dv)	20% Best days (dv)
Hawaii Volcanoes NP	7.47	2.35
Haleakala NP	7.27	2.15

EPA also referred to WRAP calculations using the new IMPROVE equation. Table 3 shows the natural visibility values for each Class I Area for the 20% worst days and 20% best days using the new IMPROVE Equation and Natural Conditions II algorithm.

TABLE 3—NATURAL VISIBILITY VALUES FOR THE 20% BEST DAYS AND 20% WORST DAYS USING THE NEW IMPROVE EQUATION [11]

Class I area	20% Worst days (dv)	20% Best days (dv)
Hawaii Volcanoes NP	7.2	2.2
Haleakala NP	7.4	2.7

[7] Information presented here is based on the IMPROVE data presented at the WRAP Technical Support System (TSS) (*http://vista.cira.colostate.edu/tss/*). This information is available in the docket in the document titled ''Technical Support Document for the Proposed Action on the Federal Implementation Plan for the Regional Haze Program in the State of Hawaii,'' Air Division, EPA Region 9, May 14, 2012 [hereinafter ''FIP TSD''].

[8] Since visibility conditions are expressed in terms of deciviews (dv), changes in visibility conditions are typically expressed in terms of ''delta deciviews'' or ''delta dv.''

[9] Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, September 2003 EPA–454/B–03–005, Appendix B Default Natural b_{ext}, dv, and 10th and 90th Percentile dv Values at All Mandatory Federal Class I Areas.

[10] The IMPROVE program is a cooperative measurement effort governed by a steering committee composed of representatives from Federal agencies (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 anthropogenic visibility impairment. The IMPROVE program has also been a key instrument in visibility-related research, including the advancement of monitoring instrumentation, analysis techniques, visibility modeling, policy formulation and source attribution field studies.

The new IMPROVE equation takes into account the most recent review of the science [12] and accounts for the effect of particle size distribution on light extinction efficiency of sulfate, nitrate, and organic carbon (OC). It also adjusts the mass multiplier for OC (particulate organic matter) by increasing it from 1.4 to 1.8. New terms were 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, EC (light-absorbing carbon), fine soil, and coarse mass terms, do not change between the original and new IMPROVE equations.

The natural visibility value estimations for 2064 do not include an estimate of the visibility impairment from the emissions from the Kilauea volcano, which is located in the Hawaii Volcanoes NP. The emissions from the volcano vary from year to year, and it is not possible to estimate the emissions from the volcano or the effect they will have on Class I area visibility in the year 2064. Therefore, in estimating natural conditions for purposes of this first planning period, we have assumed that there will be no visibility impact from the volcano.

2. Estimating Baseline Conditions

As required by section 51.308(d)(2)(i) of the Regional Haze Rule and in accordance with our 2003 Natural Visibility Guidance, EPA calculated baseline visibility conditions for Hawaii Volcanoes NP and Haleakala NP. The baseline condition calculation begins with the calculation of light extinction, using the IMPROVE equation. The IMPROVE equation sums the light extinction [13] resulting from individual pollutants, such as sulfates and nitrates. As with the natural visibility conditions calculation, EPA chose to use the new IMPROVE equation.

The period for establishing baseline visibility conditions is 2000 through 2004, and baseline conditions must be calculated using available monitoring data. 40 CFR 51.308(d)(2). This FIP proposes to use visibility monitoring data collected by IMPROVE monitors located in the two Hawaii Class I areas for the years 2001 through 2004 and the resulting baseline conditions represent an average for 2001 through 2004. A complete year of monitoring data was not available for 2000; therefore, data from 2000 were not included in the baseline calculations. Table 4 shows the baseline conditions for the two Class I areas.

TABLE 4—BASELINE CONDITIONS ON 20% WORST DAYS AND 20% BEST DAYS

Class I area	20% Worst days (deciview)	20% Best days (deciview)
Hawaii Volcanoes NP	18.9	4.1
Haleakala NP	13.3	4.6

3. Summary of Baseline and Natural Conditions

To address the requirements of 40 CFR 51.308(d)(2)(iv)(A), EPA also calculated the number of deciviews by which baseline conditions exceed natural visibility conditions at each Class I area. Table 5 shows the number of deciviews by which baseline conditions exceed natural visibility conditions at each Class I area.

TABLE 5—NUMBER OF DECIVIEWS BY WHICH BASELINE CONDITIONS EXCEED NATURAL VISIBILITY CONDITIONS

Class I area	20% Worst days	20% Best days
Hawaii Volcanoes NP	11.7	1.9
Haleakala NP	5.8	1.9

4. Uniform Rate of Progress

In setting the RPGs, EPA reviewed the IMPROVE data to analyze and determine the URP needed to reach natural visibility conditions by the year 2064. In so doing, the analysis compared the baseline visibility conditions in each Class I area to the natural visibility conditions in each Class I area (as described above) and determined the URP needed in order to attain natural visibility conditions by 2064 in the two Class I areas. The analysis constructed the URP consistent with the requirements of the Regional Haze Rule and consistent with our 2003 Tracking Progress Guidance by plotting a straight line from the baseline level of visibility impairment for 2000 through 2004 to the level of visibility conditions representing no anthropogenic impairment in 2064 for each Class I area. The URPs are summarized in Table 6. The degree of improvement to meet the URP at these sites is 1.4 deciviews at Haleakala NP and 2.7 deciviews at Hawaii Volcanoes NP.

[11] S. Copeland, M. Pitchford, R. Ames, ''Regional Haze Rule Natural Level Estimates Using the Revised IMPROVE Aerosol Reconstruction Light Extinction Algorithm''; *http://vista.cira.colostate.edu/improve/publications/graylit/032_NaturalCondIIpaper/Copeland_etal_NaturalConditionsII_Description.pdf.*

[12] The science behind the revised IMPROVE equation is summarized in our FIP TSD, in the TSD for Technical Products Prepared by the WRAP in Support of Western Regional Haze Plans (''WRAP TSD''), February 28, 2011, and in numerous published papers. See for example: Hand, J.L., and Malm, W.C., 2006, *Review of the IMPROVE Equation for Estimating Ambient Light Extinction Coefficients—Final Report.* March 2006. Prepared for IMPROVE, Colorado State University, Cooperative Institute for Research in the Atmosphere, Fort Collins, Colorado, and Pitchford, Marc., 2006, *Natural Haze Levels II: Application of the New IMPROVE Algorithm to Natural Species Concentrations Estimates.* Final Report of the Natural Haze Levels II Committee to the RPO Monitoring/Data Analysis Workgroup. September 2006.

[13] The amount of light lost as it travels over one million meters. The haze index, in units of deciviews, is calculated directly from the total light extinction, b_{ext} expressed in inverse megameters (Mm^{-1}), as follows: $HI = 10 \ln(b_{ext}/10)$.

TABLE 6—SUMMARY OF UNIFORM RATE OF PROGRESS FOR 20% WORST DAYS

Class I area	Baseline condition (dv)	Natural visibility (dv)	Total improvement by 2064 (dv)	URP (dv/year)	2018 URP visibility level (dv)	Improvement by 2018 (dv)
Hawaii Volcanoes NP	18.9	7.2	11.7	0.19	16.2	2.7
Haleakala NP	13.3	7.5	5.8	0.09	11.9	1.4

5. Contribution Assessment According to IMPROVE Monitoring Data

The visibility and pollutant contributions on the 20% worst visibility days for the baseline period (2000–2004) show variation across the two Class I areas in Hawaii. Table 7 shows average data from the IMPROVE monitors for 2001 through 2004.[14] The table shows light extinction from specific pollutants as well as total extinction, as determined by the monitoring data. As stated above, these data provide further detail regarding the variation across the two Class I areas in Hawaii.

TABLE 7—SPECIES-SPECIFIC LIGHT EXTINCTION FOR THE 20% WORST DAYS, DETERMINED FROM 2001–2004 MONITORING DATA

Class I area	Sulfate %	Nitrate %	Organic carbon %	Elemental carbon %	Soil %	Sea salt %	Coarse mass %
Hawaii Volcanoes NP (18.9 deciviews)	90	1	4	1	1	1	1
Haleakala NP [15] (13.3 deciviews)	61	9	10	5	1	4	9

The visibility on the 20% worst days was 18.9 deciviews at Hawaii Volcanoes NP. Sulfate is the largest contributor to visibility impairment at the park, with the volcano contributing substantially to the impact. The visibility on the 20% worst days at Haleakala NP was 13.3 deciviews. Sulfate is the largest contributor to visibility impairment at Haleakala NP, with the volcano contributing to the impact, although to a lesser extent than at the Hawaii Volcanoes NP. Nitrate from anthropogenic and natural sources contributes to 9% of the visibility degradation at the park. Coarse mass also contributes to about 9% of the visibility degradation at the park.

Organic carbon contributes to 10% and elemental carbon contributes to 5% of the visibility impairment at the current monitoring site (HALE1), which is located outside the park. However, more recent data measured at the Haleakala Crater site (HACR1) site at the Haleakala National Park Border shows lower concentrations of organic and elemental carbon than the HALE1 monitoring site.[16] [17]

C. Hawaii Emissions Inventories

1. Statewide Emissions Inventories

40 CFR 51.308(d)(4)(v) requires that EPA maintain a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I Federal 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. The Regional Haze Rule does not specify the baseline year for the inventory, but EPA has recommended that 2002 be used as the inventory base year.[18] 2002 is generally appropriate as the baseline year for Regional Haze SIPs because it corresponds with the 2000–2004 period for establishing baseline visibility conditions, based on available ambient monitoring data, pursuant to 40 CFR 51.308(d)(2)(i).

For this first Hawaii Regional Haze implementation plan, Hawaii DOH initially selected 2005 as their base year because it was the most recent year with a full inventory when they began their technical work.[19] Since 2005 is not within the baseline period of 2000–2004, EPA has performed a comparison of the aerosol composition of the 2005 data and 2001–2004 data for each Class I Area. This analysis showed overall level and speciation of pollutants measured at the Class I area monitors in 2005 was consistent with the overall level and speciation of pollutants during the 2001–2004 baseline period. Since the measured visibility-impairing pollution in 2005 was consistent with the baseline years, it is reasonable to assume that the 2005 emissions were sufficiently consistent with the exmissions in 2000–2004 for this year to be used as the baseline for the Regional Haze Plan.[20] Therefore, we propose to use 2005 as the base year inventory.

The majority of the 2005, 2008, and 2018 inventories were derived from a 2010 study conducted by Environ on behalf of the Hawaii DOH.[21] The numbers developed by Environ were then refined and improved by HI DOH.[22] Between the time when the Environ Study was conducted and the development of this proposed FIP, EPA finalized a new model for the estimation of emissions from on-road vehicles. This

[14] Additional data and information can be found at: *http://views.cira.colostate.edu/web/DataFiles/SummaryDataFiles.aspx.*

[15] Data from the Haleakala Monitor (HALE1), located outside Haleakala NP.

[16] Comparison of Haleakala National Park HALE1 and HACR1 IMPROVE Monitoring Site 2007–2008 Data Sets, March 30, 2012, State of Hawaii, Department of Health, Clean Air Branch.

[17] Review of VIEWS2.0 2009–2010 Haleakala National Park Organic and Elemental Carbon Data, March 30, 2012, State of Hawaii, Department of Health, Clean Air Branch.

[18] Memorandum from Lydia N. Wegman, ''2002 Base Year Emission Inventory SIP Planning: 8-Hour Ozone, $PM_{2.5}$ and Regional Haze Programs'' (November 18, 2002).

[19] Email from Priscilla Ligh, Hawaii DOH, to Gregg Nudd, EPA, May 3, 2012.

[20] Sections II.A.4 and II.B.4 of the FIP TSD.

[21] ''Final Emission Inventory Report: Data Population for Air System for Hawaii Emissions Data (AirSHED),'' Environ International Corporation, April 12, 2010.

[22] See email from Priscilla Ligh, HI DOH to Greg Nudd, USEPA, on November 18, 2011 and associated document: ''RevA Emissions inventory response to EPA 11–17–11 for EPA.doc'' The document also explains any differences between the Hawaii DOH numbers and the emissions inventory in the National Emission Inventory for Hawaii.

new model, MOVES, provides for a more accurate estimation of emissions from these sources. EPA worked with the University of North Carolina (UNC) and ICF International to develop a new emissions inventory for on-road vehicles for Hawaii for the years 2005, 2008 and 2018.[23] Tables 8 through 10 reflect these revised emissions numbers.

EPA also worked with UNC and ICF to improve the 2018 emissions estimates for marine sources. Environ used the best data available at the time, but did not account for the impact of the economic recession on marine vessel activity, and cruise ships in particular. In addition, Environ did not take into account the impact of the North American Emissions Control Area (NAECA). The United States Government, together with Canada and France, established the NA ECA under the auspices of Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL Annex VI), a treaty developed by the International Maritime Organization. This ECA will require use of lower sulfur fuels in ships operating within 200 nautical miles of the majority of the U.S. and Canadian coastline, including the U.S. Gulf Coast and Hawaii, beginning in August 2012. The ECA will result in lower NO_X and SO_2 emissions from marine sources in Hawaii. Therefore, UNC and ICF have updated the 2018 inventory to include the benefits of the ECA. The 2018 marine emissions estimates in Table 8 are based on this more recent work by UNC and ICF.[24]

TABLE 8—STATEWIDE EMISSIONS INVENTORY FOR 2005

[Tons per year]

Source category	NO_X	SO_2	VOC	PM	NH_3
Point Sources	22,745	27,072	2,695	3,536	12
Area Sources	1,509	3,716	16,920	33,408	11,136
Windblown Dust				46,808	
Wildfire	2,156	591	4,729	9,771	540
Agricultural Burning	406	178	535	1,567	60
Other fire	1		7	7	
On-Road Mobile Sources	20,642	321	12,066	638	1,085
Non-Road Mobile Sources	4,750	534	6,121	484	5
Aircraft	1,541	135	262	165	
In and Near Port Marine	2,572	2,201	92	183	
Underway Marine (<30 nm[25])	3,052	1,418	117	215	
Trains	5				
Volcano		961,366			
Sea Spray				382,637	
Biogenic	4,617		130,153		
Total	63,996	997,532	173,697	479,419	12,838
Anthropogenic Total	59,379	36,166	43,544	96,782	12,838

TABLE 9—STATEWIDE INVENTORY FOR EMISSIONS 2008

[Tons per year]

Source category	NO_X	SO_2	VOC	PM	NH_3
Point Sources	20,246	25,849	2,544	3,389	12
Area Sources	1,166	15,767	18,025	34,917	11,275
Windblown Dust				46,808	
Wildfire	2,156	591	4,729	9,771	540
Agricultural Burning	406	178	535	1,567	60
Other fire	1		8	7	
On Road Mobile Sources	14,239	97	8,526	547	1,124
Non Road Mobile Sources	4,573	78	4,912	422	5
Aircraft	2,568	260	628	123	
In and Near Port Marine	12,432	2,638	308	605	
Underway Marine (<30 nm)	562	282	18	42	
Trains	5				
Volcano		1,195,314			
Sea Spray				382,637	
Biogenic	4,617		130,153		
Total	62,971	1,241,054	170,386	480,835	13,017
Anthropogenic Total	58,354	45,740	40,233	98,198	13,017

TABLE 10—STATEWIDE EMISSIONS INVENTORY FOR 2018

Source category	NO_X	SO_2	VOC	PM	NH_3
Point Sources	28,594	36,212	4,157	5,052	13

[23] Technical Analysis for Hawaii's Regional Haze FIP Report—Task 16: On-Road Mobile Emissions Inventory, ICF International, March 23, 2012.

[24] ''Technical Analysis for Hawaii's Regional Haze FIP Report—Task 16: Commercial Marine Inventory,'' ICF International, April 2, 2012.

[25] Nautical miles.

TABLE 10—STATEWIDE EMISSIONS INVENTORY FOR 2018—Continued

Source category	NO_X	SO_2	VOC	PM	NH_3
Area Sources	1,723	3,524	20,054	43,506	12,530
Windblown Dust				46,808	
Wildfire	2,156	591	4,729	9,771	540
Agricultural Burning	406	178	535	1,567	60
Other fire	1		8	7	
On Road Mobile Sources	5,058	72	3,883	400	1,478
Non Road Mobile Sources	3,090	7	4,579	297	7
Aircraft	1,920	167	466	194	
In and Near Port Marine	2,097	117	92	50	
Underway Marine (<30nm)	1,867	68	78	33	
Trains	5				
Volcano		683,746			
Sea Spray				421,222	
Biogenic	4,617		130,153		
Total	51,533	724,681	168,734	528,908	14,628
Anthropogenic Total	46,916	40,935	38,581	107,686	14,628

2. Review of the Emissions Inventory for Completeness and Accuracy

EPA has reviewed the methods used by Environ, the Hawaii Department of Health and ICF in developing this inventory. We propose to find that the best available emissions factors and activity data were used in developing the emissions estimates. We also propose to find that the inventory captures all of the emissions sources relevant to the development of a Regional Haze Plan.

3. Assessment of the Emissions Inventory

There are a few important conclusions to draw from the 2005, 2008, and 2018 statewide emissions inventories in Tables 8 through 10. First, nonanthropogenic emissions are significant for SO_2, VOC and PM. As one can see from the tables above, the volcano dominates statewide SO_2 emissions. Emissions from the volcano comprise over 96% of the SO_2 emissions in 2005 and 2008. On days when the volcano is erupting and the winds are carrying those emissions over the Class I area monitors, these natural emissions will dominate the measurements. Nonanthropogenic sources also comprise the majority of VOC and PM emissions. Second, total statewide anthropogenic emissions of NO_X and VOC are decreasing. Human-made NO_X pollution is projected to be 21% lower in 2018 than in 2005. Human-made VOC pollution is projected to decrease by 11%. These reductions are primarily due to EPA regulations for on-road vehicles. Emissions from cars and trucks are decreasing dramatically, even accounting for economic and population growth. This is due to older, higher emitting vehicles being replaced by ones with more modern air pollution controls. NO_X emissions in this category are projected to decrease by over 15,000 tpy and VOC emissions by over 8,000 tpy between 2005 and 2018.

However, anthropogenic SO_2 emissions are expected to increase between 2005 and 2018, largely due to increased emissions from point sources. The lower sulfur marine fuels required by the ECA are expected to result in a 95% reduction in emissions from shipping, but those reductions are overwhelmed by the increases from point source emissions. The growth rate of point source emissions is very sensitive to assumptions about future economic growth. The Environ report, from which this data is derived, assumes robust economic growth between 2005 and 2018. Given the economic recession that began in late 2008 this level of emission growth will likely over-predict future anthropogenic emissions. Nevertheless, this is the best data available.

Our analysis of the monitoring data indicates that SO_2 is the principal pollutant of concern for this planning period. *See* section III.D below. The visibility impacts of NO_X and VOC emissions are of secondary importance. *Id.* The increase in anthropogenic SO_2 emissions indicates that additional pollution reductions are needed to ensure reasonable progress toward the goal of eliminating anthropogenic visibility impairment in Hawaii's mandatory class I areas. Our proposal to achieve these reductions is explained in section III.F of this notice.

D. Sources of Visibility Impairment in Hawaii Class I Areas

In order to determine the significant sources contributing to haze in Hawaii's Class I areas, EPA relied upon the monitoring data from the IMPROVE network and the emission inventory for the State of Hawaii. EPA also reviewed the source apportionment analysis developed by Hawaii DOH[26] as well as the source apportionment analysis by the National Oceanic and Atmospheric Administration (NOAA).[27]

Table 11, below, shows the percentage contribution of different pollutant species to light extinction at the two Class I Areas in Hawaii on the 20% Worst Days in 2001 to 2004.

[26] Haleakala NP Visibility Assessment, Hawai'i Volcanoes NP Visibility Assessment, and IMPROVE PMF Factor Identification notes Positive Matrix Factorization Analysis of HALE1 & HAVO1 IMPROVE data sets April 20, 2012, State of Hawaii, Department of Health, Clean Air Branch.

[27] M. Pitchford, ''Causes of Haze for Hawaii's Two Class I Areas'', presented at United States Department of Agriculture, Agricultural Air Quality Task Force Meeting, Wailea, Hawaii, November 13 and 15, 2005.

TABLE 11—SPECIES-SPECIFIC LIGHT EXTINCTION DETERMINED FROM 2001–2004 IMPROVE MONITORING DATA—20% WORST DAYS

Class I area	Sulfate %	Nitrate %	Organic carbon %	Elemental carbon %	Soil %	Sea salt %	Coarse mass %
Hawaii Volcanoes NP ..	90	1	4	1	1	1	1
Haleakala NP[28]	61	9	10	5	1	4	9

Sulfate is the largest cause of visibility degradation on the 20% worst days at both Haleakala NP and Hawaii Volcanoes NP. Natural causes of sulfate include the emissions from the Kilauea volcano, located in the Hawaii Volcanoes NP, and natural marine sulfates. The emissions and impact of the volcano varies substantially from year to year. Source apportionment assessments have estimated that the volcano causes approximately 90% of the visibility impairment at Hawaii Volcanoes NP and approximately 60% of the visibility impairment at Haleakala NP on the 20% worst days. The natural marine sulfate impact is expected to be much smaller.[29] International transport may also contribute to sulfur visibility impairment. Anthropogenic sources of sulfur include oil combustion, and shipping.

Nitrate contributes 9% to the visibility degradation on the 20% worst days at Haleakala. The major anthropogenic sources of nitrate on Maui are point sources, on-road and non-road mobile sources, and shipping. Nitrate contributes 1% to the visibility degradation on the 20% worst days at Hawaii Volcanoes NP.

Organic Carbon contributes to 10% of the visibility degradation at the Haleakala (HALE1) monitor, which is located outside of the park. A comparison of monitoring data at the Haleakala Crater (HACR1) IMPROVE monitoring site at the Haleakala Site boundary shows approximately half the level of organic carbon of the HALE1 site.[30] Sources of organic carbon include agricultural burning, oil combustion, and international transport. Organic Carbon contributes 4% of the visibility degradation at the Hawaii Volcanoes NP during the 2001–2004 time period, although more recent data from 2005–2009 indicate that organic carbon contributes to 1% of the visibility impairment for the 20% worst days.

Elemental Carbon contributes to 5% of the visibility degradation at the Haleakala (HALE1) monitor, which is located outside of the park. A comparison of recent monitoring at the Haleakala Crater monitoring site at Haleakala NP (HACR1) shows a lower level of elemental carbon of the HALE1 site.

Coarse mass contributes to 9% of the visibility degradation at the Haleakala (HALE1) monitor. The sources of coarse mass include fugitive dust, international transport, and shipping. Soil contributes to 1% of the visibility degradation at each of the Class I Areas. The soil impact varies seasonally, with the highest levels in the springtime, and appears to be associated with international transport.

EPA has evaluated the six particulate pollutants (ammonium sulfate, ammonium nitrate, organic carbon (OC), elemental carbon (EC), fine soil and coarse mass (CM)) that contribute to visibility impairment at Hawaii's two mandatory Class I federal areas, and determined that the first Regional Haze Plan RP evaluation should focus primarily on significant sources of SO_2 (sulfate precursor). NO_X (nitrate precursor) is a secondary concern.

The sources of coarse mass (CM) are uncertain because of emission inventory limitations associated with natural sources (predominantly wildfires) and uncertainty of fugitive (windblown) emissions. Because of the difficulty in attributing the sources of visibility impairment for this pollutant, EPA has determined that it is not reasonable in this planning period to recommend emission control measures for coarse mass. Coarse mass contribution to visibility impairment, emissions sources, and potential control measures should be addressed in future Regional Haze plan updates.

Because fine soil appears to be primarily attributable to international transport, EPA has determined that it is not reasonable in this planning period to recommend emission control measures for fine soil. Although organic and elemental carbon contribute to base year visibility impairment, recent monitoring at the Haleakala Crater (HACR1) monitoring site and the Hawaii Volcanoes (HAVO1) show low contributions to visibility impairment from organic and elemental carbon.

E. Best Available Retrofit Technology Evaluation

1. Identification of BART-Eligible Sources

The first step of a BART evaluation is to identify all the BART-eligible sources within the state's boundaries. In 2008, the Hawaii DOH conducted a survey of the major sources in the state to identify which sources were BART eligible. This survey was completed and certified by the responsible official at each major source. Through that process, the following facilities were identified as BART-eligible: Hawaiian Commercial & Sugar Company (HC&S) Puunene facility, Chevron Refinery, Tesoro Refinery, Hu Honua Bioenergy—Pepeekeo facility, Maui Electric Company (MECO)—Kahului facility, Hawaii Electric Light Company (HELCO) Kanoelehua Hill, Hawaiian Electric Company (HECO)—Waiau facility, HECO—Kahe facility. We propose to determine that each of these facilities is BART-eligible.

2. Identification of Sources Subject to BART

The second step of the BART evaluation is to identify those BART-eligible sources that may reasonably be anticipated to cause or contribute to any visibility impairment at any Class I area, *i.e.,* those sources that are subject to BART. The BART Guidelines allow us to consider exempting some BART-eligible sources from further BART review because they may not reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area. We propose to use the dispersion modeling that the Hawaii DOH's consultant performed.[31] This modeling assessed the extent of each BART-eligible source's contribution to visibility impairment at the Class I

[28] Data from the HALE Monitor, located outside Haleakala NP.

[29] Yvon and Saltzman 1996, Atmospheric Sulfur Cycling in the Tropical Marine Boundary Layer. J. Geophys. Res. 101, 6911–6918.

[30] Review of VIEWS2.0 2009–2010 Haleakala NP Organic and Elemental Carbon Data, March 30, 2012, State of Hawaii, Department of Health, Clean Air Branch, and Comparison of Haleakala NP HALE1 and HACR1 IMPROVE Monitoring Site 2007–2008 Data Sets, March 30, 2012, State of Hawaii, Department of Health, Clean Air Branch.

[31] Subject-to-Best Available Retrofit Technology (BART) Modeling for the State of Hawaii, Application of the CALPUFF Modeling System, March 3, 2010, Alpine Geophysics, LLC.

areas, consistent with the BART Guidelines.

a. Modeling Methodology

The BART Guidelines provide that we may use the CALPUFF [32] modeling system or another appropriate model to predict the visibility impacts from a single source on a Class I area and to, therefore, determine whether an individual source is anticipated to cause or contribute to impairment of visibility in Class I areas, *i.e.,* ''is subject to BART.'' The Guidelines state that we find CALPUFF is the best regulatory modeling application currently available for predicting a single source's contribution to visibility impairment (70 FR 39162 (July 6, 2005)).

The BART Guidelines indicate that a modeling protocol be developed for determining individual source attributions. The State of Hawaii's contractor, Alpine Geophysics, developed a protocol, which was reviewed by the State of Hawaii and EPA.[33] Although the BART Guidelines recommend use of a minimum of three years of mesoscale meteorological model output for conducting this type of analysis, only one year (2005) of mesoscale meteorological data was available at the time this protocol was developed.[34] Therefore, emissions were modeled over a one-year period using the 2005 mesoscale meteorological data.[35] Consistent with the BART Guidelines, this modeling was based on maximum actual 24-hour emissions for each source. EPA believes that this modeling provides a reasonable estimate of daily visibility impacts above estimated natural conditions at each Class I area. Therefore, we propose to use the results of this CALPUFF modeling to determine whether each BART-eligible source has a significant impact on visibility.

b. Contribution Threshold

For the modeling to determine the applicability of BART to single sources, the BART Guidelines note that the first step is to set a contribution threshold to assess whether the impact of a single source is sufficient to cause or contribute to visibility impairment at a Class I area. The BART Guidelines state that, ''[a] single source that is responsible for a 1.0 deciview change or more should be considered to 'cause' visibility impairment.'' 70 FR 39161, July 5, 2005. The BART Guidelines also state that ''the appropriate threshold for determining whether a source contributes to visibility impairment may reasonably differ across states,'' but, ''[a]s a general matter, any threshold that you use for determining whether a source 'contributes' to visibility impairment should not be higher than 0.5 deciviews.'' *Id.* Further, in setting a contribution threshold, states or EPA should ''consider the number of emissions sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts.'' The Guidelines affirm that states and EPA are free to use a lower threshold if they conclude that the location of a large number of BART-eligible sources in proximity to a Class I area justifies this approach.

For its analysis, Hawaii chose to use the recommended 0.5 deciview threshold for subject-to-BART determination and RP prioritization. EPA believes this threshold is appropriate, based on the number of sources affecting the Class I areas and the magnitude of the individual sources impacts. Therefore, we propose to use a contribution threshold of 0.5 deciviews for determining which sources are subject to BART.

c. Sources Identified by EPA as Subject to BART

The CALPUFF modeling analysis was performed to determine which BART-eligible sources in Hawaii are subject to BART.[36] The modeling assessment looked at the HC&S Puunene facility, the Chevron Refinery, the Tesoro Refinery, the Hu Honua Bioenergy—Pepeekeo facility, the MECO—Kahului facility, the HELCO Kanoelehua Hill facility, the HECO—Waiau facility, and the HECO—Kahe facility. The only facilities that showed a 98th percentile (8th high) 24-hour average visibility impact over the 0.5 delta deciview impact threshold were the Hu Honua Bioenergy—Pepeekeo and the HELCO—Kanoelehua Hill facilities. Thus, the Hu Honua Bioenergy—Pepeekeo and the HELCO—Kanoelehua Hill facilities are subject to BART. The remaining facilities; HC&S Puunene facility, the Chevron Refinery, the Tesoro Refinery, the MECO—Kahului facility, the HECO—Waiau facility, and the HECO—Kahe facility are not subject to BART.

As shown in Table 12, EPA proposes to exempt six of the eight BART-eligible sources in the State from further review under the BART requirements. The visibility impacts attributable to each of these sources fell below 0.5 deciviews. Our proposed contribution threshold captures those sources responsible for most of the total visibility impacts, while still excluding other sources with very small impacts.

The results of the CALPUFF modeling are summarized in Table 12. Those facilities listed with demonstrated impacts at all Class I areas less than 0.5 deciviews are proposed by EPA to not be subject to BART; those with impacts greater than 0.5 deciviews are proposed by EPA to be subject to BART.

TABLE 12—INDIVIDUAL BART-ELIGIBLE SOURCE VISIBILITY IMPACTS ON HAWAII CLASS I AREAS

Source and unit	Class I area	Maximum 24-hour 98th percentile visibility impact (deciview)	Subject to BART or exempt
HC&S Puunene facility (Bagasse)	Haleakala Hawaii Volcanoes	0.059 0.008	Exempt.

[32] Note that our reference to CALPUFF encompasses the entire CALPUFF modeling system, which includes the CALMET, CALPUFF, and CALPOST models and other pre and post processors. The different versions of CALPUFF have corresponding versions of CALMET, CALPOST, etc. which may not be compatible with previous versions (e.g., the output from a newer version of CALMET may not be compatible with an older version of CALPUFF). The different versions of the CALPUFF modeling system are available from the model developer at *http://www.src.com/calpuff/calpuff1.htm.*

[33] Subject-to-Best Available Retrofit Technology (BART) and Reasonable Progress (RP) Prioritization Modeling Protocol for the State of Hawaii Application of the CALPUFF Modeling System, November 30, 2009, Alpine Geophysics, LLC.

[34] MM5 Application for 2005 Over the Hawaiian Islands, prepared for Hawaii State Department of Health, Environmental Management Division, Clean Air Branch Prepared by: Alpine Geophysics, LLC.

[35] Three years (2005, 2006, 2007) of MM5 data have since been prepared for HECO. MM5 Meteorological Dataset Development for Hawaii, Draft December 2008, JCA. EPA has not reviewed this additional data, but may evaluate and consider this data for future visibility actions.

[36] Subject-to-Best Available Retrofit Technology (BART) Modeling for the State of Hawaii, Application of the CALPUFF Modeling System, Alpine Geophysics, LLC, 3 March 2010.

TABLE 12—INDIVIDUAL BART-ELIGIBLE SOURCE VISIBILITY IMPACTS ON HAWAII CLASS I AREAS—Continued

Source and unit	Class I area	Maximum 24-hour 98th percentile visibility impact (deciview)	Subject to BART or exempt
HC&S Puunene facility (Coal)	Haleakala Hawaii Volcanoes	0.133 0.039	Exempt.
Chevron Refinery	Haleakala Hawaii Volcanoes	0.021 0.016	Exempt.
Tesoro Refinery	Haleakala Hawaii Volcanoes	0.025 0.017	Exempt.
Hu Honua Bioenergy—Pepeekeo facility	Haleakala Hawaii Volcanoes	0.323 0.540	Subject to BART.
MECO—Kahului facility	Haleakala Hawaii Volcanoes	0.232 0.108	Exempt.
HELCO Kanoelehua Hill	Haleakala Hawaii Volcanoes	0.808 2.334	Subject to BART.
HECO—Waiau facility	Haleakala Hawaii Volcanoes	0.083 0.038	Exempt.
HECO—Kahe facility	Haleakala Hawaii Volcanoes	0.221 0.132	Exempt.

The owner of the Hu Honua Bioenergy relinquished the facility's existing permit on September 16, 2010 and the facility was issued a new permit on August 31, 2011, which allows the facility to burn only non-fossil fuels.[37] Since the facility can no longer burn fossil fuels, it is no longer BART-eligible and thus not subject to BART. Therefore, the only subject-to-BART source in Hawaii is the HELCO Kanoelehua Hill facility.

3. BART Determination for Kanoelehua Hill

The third step of a BART evaluation is to perform the BART analysis. The BART Guidelines (70 FR 39164 (July 6, 2005)) describe the BART analysis as consisting of the following five steps:

- Step 1: Identify All Available Retrofit Control Technologies;
- Step 2: Eliminate Technically Infeasible Options;
- Step 3: Evaluate Control Effectiveness of Remaining Control Technologies;
- Step 4: Evaluate Impacts and Document the Results; and
- Step 5: Evaluate Visibility Impacts.

In determining BART, the state, or EPA if implementing a FIP, must consider the five statutory factors in section 169A of the CAA: (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. *See also* 40 CFR 51.308(e)(1)(ii)(A). The actual visibility impact analysis occurs during steps 4 and 5 of the process.

As mentioned previously, the only source in Hawaii subject to BART is the Kanoelehua Hill Generating Station (Hill) on the Island of Hawaii (the Big Island). Specifically, there are two residual fuel oil-fired boilers at this plant that are subject to BART (Hill 5 and Hill 6). Hill 5 is a 14 megawatt (MW) front-fired boiler. Hill 6 is a 21 MW tangentially fired boiler. Both boilers currently burn residual oil with a sulfur content not to exceed 2% by weight. Table 13 summarizes the baseline emission rates and modeled visibility impact of these sources. The annual emissions are based on 2009 operations because 2009 was the most current, complete year of data available when this modeling was performed in 2010.

TABLE 13—BASELINE EMISSIONS AND VISIBILITY IMPACTS OF HILL

SO_2 emissions	tons per year [tpy]	2,778
NO_X emissions	tpy	735
PM emissions	tpy	70
Visibility impact on Haleakala.[38]	delta dv	0.44
Visibility impact on Hawaii Volcanoes NP	delta dv	1.56

Trinity Consulting, on behalf of HELCO, the plant operator, performed a five-factor analysis for this plant.[39] We have reviewed this analysis and believe it adequately addresses the five BART factors. Although the BART guidelines are not mandatory for Hill because the plant's total generating capacity is less than 750 megawatts, the Trinity analysis is generally consistent with the guidelines. Our analysis of the five factors is largely based on the Trinity report.

a. BART for NO_X and Particulate Matter (PM)

The Trinity report appropriately examined BART controls for NO_X and PM. However, due to the overwhelming contribution of sulfate to visibility impairment at the nearby Hawaii

[37] Letter from Stuart Yamada, Hawaii DOH, to John C. Silvia, Hu Honua Bioenergy (August 31, 2011) attaching Covered Source Permit (CSP) No. 0724–01–C and Covered Source Permit Review Summary.

[38] These results from Trinity's modeling indicate a lower impact than Alpine's modeling. However, even with Trinity's modeling, the baseline impacts are high enough to make the source subject to BART.

[39] BART Five-Factor Analysis Prepared for Hawaiian Electric Light Company, October 2010, Trinity Consultants.

Volcanoes Class I area, it is unlikely that reductions in these pollutants from Hill would have a measurable impact on visibility at that area.

For PM, the Trinity report considered the following technologies: Dry electrostatic precipitator (ESP), wet ESP, fabric filter, wet scrubber, cyclone and fuel switching. Dry ESPs, cyclones and fabric filters are not appropriate for the type of particulate emitted by this plant. A wet scrubber would work, but these types of devices are better suited to larger particulate than is emitted from an oil-fired boiler and their control efficiency would be small. A wet ESP would have good control efficiency and is technically feasible. Similarly, switching to distillate fuel would be an effective and technically feasible control for PM. Trinity estimated the cost effectiveness of a wet ESP as $13,000 per ton of PM controlled. They estimated the cost effectiveness of switching to distillate fuel as $170,000 per ton. Neither of these controls would be cost effective for PM.

For NO_X, the Trinity report considered both combustion controls such as flue gas recirculation and low-NO_X burners as well as post-combustion controls such as selective catalytic reduction (SCR). There were no technical barriers to implementing any of these controls. The post-combustion controls were not found to be cost effective. Low-NO_X burners were found to be cost effective by the Trinity report. However, given the monitoring data on Hawaii, EPA finds that the emission reductions provided by low-NO_X burners is unlikely to provide a measurable visibility benefit at Hawaii Volcanoes or Haleakala.

Based on our consideration of the five BART factors, EPA has determined that no control for NO_X and PM at the Hill plant is consistent with BART, given the unique conditions in Hawaii. NO_X reductions may need to be pursued in future planning periods as anthropogenic sulfates are reduced and nitrates become a larger portion of anthropogenic visibility impairment.

b. BART for SO_2

The principal visibility-impairing pollutant from the Hill Plant is SO_2. As explained above, sulfates are the largest component of visibility impairment at Hawaii Volcanoes and at Haleakela, even on the best days. The Hill Plant is by far the largest source of anthropogenic SO_2 emissions on the Big Island.

The Trinity report considered both flue gas desulfurization (FGD) and fuel switching as possible controls. The report found that no other oil-fired electric generating unit had installed FGD technology and due to the lack of industry experience, the technology was infeasible. EPA agrees that FGD technology is unproven for this application and concurs with Trinity's decision to focus on fuel switching. However, the Trinity analysis only looked at switching to distillate fuel oil. Distillate fuel oil is substantially more expensive than residual fuel oil and it provides less energy per gallon. As a result, it is not a cost effective control measure.

EPA requested HECO to consider switching to lower sulfur residual fuel oil, which would be a less expensive option. HECO responded with its own cost effectiveness estimate.[40] The lowest cost option, residual fuel oil no more than 1% sulfur by weight, had a cost effectiveness of between $6,677/ton and $7,363/ton.

EPA considered this cost estimate to be too high in light of available market data and conducted our own analysis, which is summarized in Table 14, below, and further explained in the TSD for this action.

TABLE 14—COST AND BENEFITS OF SWITCHING TO 1% SULFUR FUEL OIL

Baseline Weight % Sulfur [S]	1.57
Baseline Fuel Consumption [gal/yr]	18,650,604
Baseline Emissions [tons SO_2/yr]	2,344
New Fuel Weight % S	1.00
Cost Differential [$/gal]	0.255
Controlled Emissions [tons SO_2/yr]	1,493
Annual Costs [$/yr]	4,755,904
Annual Emission Reductions [tons SO_2/yr]	851
Cost Efficiency [$/ton SO_2 reduced]	5,587

Based on this analysis, EPA estimates that requiring a switch to 1% sulfur fuel oil would result in a reduction in SO_2 emissions of 851 tons per year and an increase in fuel costs of over $4.7 million/year. Thus, the cost effectiveness of this control option is estimated to be approximately $5,600/ton. EPA contracted with the energy economics consulting firm Energy Strategies to estimate the impact of these increased fuel costs on electric rates.[41] Based on its analysis, these increased costs would translate into a roughly 1% increase in retail electric rates on the Big Island.

The next factors to consider are: (2) The energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; and (4) the remaining useful life of the source. There are no existing pollution controls at the site for SO_2. We have considered factors (2) and (4) in the context of the Hawaii Clean Energy Initiative, a collaborative effort by the State of Hawaii, the U.S. Department of Energy and various other stakeholders. The Initiative's ultimate goal is meeting 70% of the state's energy needs through energy efficiency and renewable energy by 2030. One of the key pieces of legislation aimed at achieving this goal is Hawaii's 2009 Clean Energy Omnibus Bill (ACT 155 (09), HB 1464, signed June 25, 2009). This statute calls for 30% reduction in the state's energy use via efficiency and increases the state's renewable portfolio standard to 40% by 2030. EPA contracted with UNC and ICF to project the 2018 emissions of power plants considering the requirements of the Clean Energy Omnibus Bill.[42] These projections are compared to the current 2018 projections based on the most recent Integrated Resource Plan (IRP) for Hawaii electric utilities. This IRP predates the 2009 bill and so does not account for its requirements. Table 15 compares the baseline emission projections for 2018, derived from the current IRP and the projections that take into account the requirements of the Clean Energy Bill.

[40] Letter from Brenner Munger, Manager, Environmental Department, Hawaiian Electric Company to Tom Webb, U.S. EPA Region 9, January 27, 2012.

[41] Fuel Cost Screening Tool (r1 4–18–12), Energy Strategies Incorporated, April 18, 2012.

[42] Email from Juanita Haydel, ICF Corporation to Greg Nudd, EPA Region 9, April 4, 2012, with spreadsheet titled: ''Hawaii Emissions Values_Revised_040412_FTC.xlsx.''

TABLE 15—RANGE OF 2018 EMISSIONS PROJECTIONS FOR HILL
[Tons per year]

	2018 SO_2 emissions	2018 SO_2 emissions
	IRP	Clean energy bill
Kanoelehua Hill Generating Station	3,264	765

The projections based on the goals of the Clean Energy Bill assume that the energy conservation and renewable energy goals will be met in a more or less even fashion year to year. So, by 2018, most of these projects will be in place. This is a fairly optimistic scenario, but it gives some insight into the impact of the Clean Energy Bill. By 2018, Hill is projected to be operating at a significantly lower capacity factor and/or burning biofuels with much less sulfur. Although the resulting reductions in sulfur emissions are not enforceable requirements, they suggest that SO_2 emissions from Hill *may* decrease even in the absence of any BART requirements. This analysis also indicates that at least some of the units at Hill may be coming to the end of their useful life within the next 20 years.

The final factor to consider is the visibility benefits of controls. Under the BART Guidelines, the improved visibility in deciviews from installing controls is determined by using the CALPUFF air quality model. CALPUFF, generally, simulates the transport and dispersion of emissions, and the conversion of SO_2 to particulate sulfate and NO_X to particulate nitrate, at a rate dependent on meteorological conditions and background ozone concentration. These concentrations are then converted to delta deciviews by the CALPOST post-processor. The CALPUFF modeling system is available and documented at EPA's Model Distribution Web page.[43]

The ''delta deciviews'' for control options estimated by the modeling represents a BART source's impact on visibility at the Class I areas under different control scenarios. Each modeled day and location in the Class I area will have an associated delta deciviews for each control option. For each day, the model finds the maximum visibility impact of all locations (*i.e.,* receptors) in the Class I area. From among these daily values, the BART Guidelines recommend use of the 98th percentile, for comparing the base case and the effects of various controls.

In its BART analysis for Hill, Trinity modeled the lower emission rates associated with lower sulfur fuels and estimated the following visibility benefits. The delta deciview (delta dv) impact from Hill decreased from 1.56 for baseline conditions to 1.05 when burning the 1% sulfur fuel, which represents an approximately 0.5 dv benefit.

Taking into consideration all of these factors, we propose to determine that BART for Hill is no additional controls. In particular, although we consider 0.5 dv to be a significant improvement in visibility, we do not believe it justifies the imposition of a control with a cost effectiveness of approximately $5,600/ton in this case. We are particularly concerned about unduly increasing electricity rates in Hawaii, given that these rates are already three times the national average according to the Energy Information Agency.[44] Therefore, we propose to determine that no BART controls be required for Hill.

Nonetheless, as explained below, our reasonable progress analysis shows that some additional SO_2 controls are needed on the Big Island in order to protect against degradation of visibility and that Hill may be an appropriate source for such SO_2 reductions.

F. Reasonable Progress Goals for Hawaii

In determining if reasonable progress is being made, states, or EPA if implementing a FIP, are required to consider the following factors established in section 169A of the CAA and in our Regional Haze Rule at 40 CFR 51.308(d)(1)(i)(A): (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 (''the four RP factors''). Once these factors have been considered, the typical method for determining if a state is making reasonable progress is to use meteorological and air quality computer models to predict the visibility at Class I areas for the end of the planning period (2018). Those modeling results are then assessed to ensure that visibility is not degrading on the best days and that it is improving on the worst days at a reasonable rate, taking into consideration the relevant statutory factors, as well as the base period visibility conditions and the goal of zero anthropogenic visibility impairment by 2064.

In the case of Hawaii, though, a different method of determining reasonable progress is required. As explained above in sections III.C.1 and III.D, the dominant cause of visibility impairment at Hawaii's Class I areas is sulfate compounds and over 96% of the sulfate emissions in Hawaii are from the volcano. However, because the volcanic eruptions vary greatly from year to year with no discernible pattern, it is impossible to predict future volcanic emissions. The emissions vary by hundreds of thousands of tons per year. As a result, there is little value in attempting to model visibility at the Class I areas in 2018.

1. Identification of Pollutants for Reasonable Progress

EPA has evaluated the six particulate pollutants (ammonium sulfate, ammonium nitrate, organic carbon (OC), elemental carbon (EC), fine soil and coarse mass (CM)) that contribute to visibility impairment at Hawaii's two mandatory Class I federal areas. Sulfate is the primary cause of visibility impairment at each of Hawaii's Class I Areas, and EPA has determined that the first Regional Haze Plan RP evaluation should focus primarily on significant sources of SO_2 (sulfate precursor). NO_X (nitrate precursor) is a secondary concern, as it contributes to 9% of the visibility degradation on the 20% worst days at Haleakala.

Coarse mass contributes to 9% of the visibility degradation at Haleakala, and is also of concern. However, the sources of coarse mass (CM) are uncertain because of emission inventory limitations associated with natural sources (predominantly wildfires) and uncertainty of fugitive (windblown) emissions. Because of the difficulty in attributing the sources of visibility impairment for this pollutant, EPA has

[43] EPA's Model Distribution Web page available at: *http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#calpuff.*

[44] *http://205.254.135.7/state/state-energy-rankings.cfm?keyid=18&orderid=1.*

determined that it is not reasonable in this planning period to recommend emission control measures for coarse mass. Coarse mass contribution to visibility impairment, emissions sources, and potential control measures should be addressed in future Regional Haze plan updates.

Because fine soil appears to be primarily attributable to international transport, EPA is proposing to determine that it is not reasonable in this planning period to recommend emission control measures for fine soil. Although organic and elemental carbon contribute to base year visibility impairment, recent monitoring at the Haleakala Crater (HACR1) monitoring site and the Hawaii Volcanoes (HAVO1) site show low contributions to visibility impairment from organic and elemental carbon.

2. Determining Reasonable Progress Through Island-Specific Emissions Inventories

Due to the absence of modeling to project visibility at Hawaii's Class I areas in 2018, EPA is focusing its reasonable progress analysis on reducing anthropogenic emissions of visibility-impairing pollution. As explained in section III.D above, the key anthropogenic pollutants of concern are SO_2 and NO_X, especially SO_2. We looked at trends in emissions of anthropogenic SO_2 and NO_X in order to judge if reasonable progress is being achieved.

Rather than use a full statewide inventory to judge reasonable progress, we focused on the inventories for the islands where the Class I areas are located: Maui and the island of Hawaii (''the Big Island''). Population, economic activity and therefore anthropogenic emissions in the State of Hawaii are concentrated on the island of Oahu. But, as explained below, our analysis indicates that those emissions do not significantly impair visibility at the Class I areas. Prevailing winds at the Honolulu Airport on Oahu are from the east-north-east.[45] The prevailing winds on Maui are from the northeast.[46] The Class I areas are south and east of Oahu. Therefore, these trade winds tend to transport pollution from Oahu away from the Class I areas. In addition, modeling performed to estimate the visibility impact of currently operating individual sources of pollution on the Class I areas in the state indicates that even very large sources on Oahu have relatively small visibility impacts on Haleakela.[47]

Given these modeling results and the prevailing winds in Oahu and Maui for this planning period, we have focused our RP analysis on the islands that contain the Class I areas. Tables 16 and 17 show the emission inventories for the islands of Maui and Hawaii.[48]

TABLE 16—MAUI ANTHROPOGENIC EMISSIONS INVENTORY

Source category	2005 Inventory		2018 Inventory	
	NO_X	SO_2	NO_X	SO_2
Point	4,492	4,559	4,597	4,625
Nonpoint	462	481	548	571
On-Road Mobile	2,957	47	758	10
Non-Road Mobile	496	57	305	2
Aircraft	310	27	376	33
Agricultural Burning	298	132	298	132
Wildfires	52	14	52	14
in/near port Marine	699	569	836	32
Total	9,765	5,887	7,770	5,420

TABLE 17—HAWAII (BIG ISLAND) ANTHROPOGENIC EMISSIONS INVENTORY

Source category	2005 Inventory		2018 Inventory	
	NO_X	SO_2	NO_X	SO_2
Point	1,036	4,551	1,736	5,266
Nonpoint	1,849	808	1,882	872
On-Road Mobile	3,217	53	839	11
Non-Road Mobile	784	95	428	1
Aircraft	177	18	207	21
Agricultural Burning	2	0	2	0
Wildfires	1,712	469	1,712	469
in/near port Marine	537	418	546	20
Total	9,314	6,412	7,352	6,661

3. Four Factor Analysis for NO_X Sources on Maui and the Big Island

As shown in tables 16 and 17, mobile sources (on-road, non-road, aircraft and marine) constitute the largest fraction of base-year emissions on both islands (48%). The NO_X emissions from these categories are projected to drop by over 7,100 tpy between 2005 and 2018. These decreases are largely attributable to a dramatic reduction in emissions from on-road mobile sources, resulting from the replacement of older, higher emitting vehicles with new vehicles that must meet more stringent standards under the Clean Air Act. In addition to these requirements for on-road sources, EPA regulations also require newer non-

[45] See prevailing winds data from the Western Regional Climate Center (*http://www.wrcc.dri.edu/htmlfiles/westwinddir.html#HAWAII*).

[46] *Ibid.*

[47] See Table VII–1 of the FIP TSD.

[48] See Emissions Inventory chapter of the FIP TSD for information on the development of these inventories.

road and marine mobile sources to meet stricter control requirements. Collectively, these federal mobile source requirements will result in substantial NO_X reductions over the course of the first planning period.

Point sources, and in particular electric utility units, also comprise a significant portion of NO_X emissions on both islands. However, considering the costs of compliance, the projected 20% net reduction in NO_X emissions from existing regulations and the small contribution of nitrates to visibility impairment, EPA does not consider it reasonable to require additional NO_X controls for point sources in this planning period.

The two remaining anthropogenic NO_X emissions sources on the islands are agricultural burning and wildfires. EPA has evaluated the monitoring data for the Class I areas and determined that there is no evidence that agricultural burning is significantly affecting visibility at the Class I areas.[49] Wildfires have been included in the anthropogenic emissions inventory because Hawaii DOH and EPA have not been able to determine if the fires had natural causes or not. However, imposing restrictions on wildfires would not have any appreciable effect, since they are, by definition, not intentional.

In sum, taking into consideration the four RP factors and the relatively small contribution of NO_X to visibility impairment at Hawaii's Class I areas, we propose not to require any additional NO_X controls for this implementation period.

4. Four Factor Analysis for SO_2 Emissions on Maui

Our analysis shows that existing requirements under the Clean Air Act will result in net reductions of anthropogenic emissions of SO_2 on Maui during this first planning period. So it is reasonable to assume that the visibility at Haleakala on the best days is not getting worse. Similarly, with this drop in emissions, it is reasonable to assume that the visibility on the worst days will improve.

a. Mobile Source SO_2 Emissions on Maui

Mobile source SO_2 emissions on Maui (on-road, non-road, aircraft and marine) are expected to decrease by 89% under current regulations, primarily as a result of reductions in marine emissions due to the ECA. This control measure is in addition to the benefits of fleet turnover as described above in the discussion of NO_X. Given the existing benefits from the ECA and the fleet turnover benefits that take into account the four factors, we propose to determine that no additional SO_2 reductions from mobile sources on Maui are needed in order to show reasonable progress.

b. Point Source SO_2 Emissions on Maui

Point Sources comprise 77% of the SO_2 emissions on Maui and are expected to increase slightly by 2018. However, this increase is more than offset by the reduction in SO_2 from mobile source emissions. The principal point sources on Maui are the Kahului Power Plant and the Maalaea Power Plant, neither of which are BART-eligible. Maalea is downwind of the Class I area and its SO_2 emissions are not expected to impact visibility at Haleakala. Prevailing winds should also transport emissions from Kahului away from Haleakala. However, CAlPUFF modeling indicates that this facility has a visibility impact of 0.667 deciviews at Haleakala.[50] While this modeling is based on conservative assumptions that are unlikely to occur during normal operations, we believe this level of modeled impact is sufficient to warrant further scrutiny of this source under the four reasonable progress factors.

TABLE 18—MAUI POINT SOURCE EMISSIONS

	2005		2018	
	NO_X	SO_2	NO_X	SO_2
MECO—Kahului Power Plant	536	3,198	542	3,233
Maalaea Generating Station	3,255	913	3,291	923
HC & S—Puunene Sugar Mill	617	424	760	469
Ameron Hawaii Camp 10 Quarry	4	0	4	0
Maui Pineapple Co.	80	24		
Total	4,492	4,559	4,597	4,625

The first RP factor is costs of compliance. HECO (the electric utility) performed a detailed analysis of the cost of reducing SO_2 emissions at the Hill as part of the BART analysis for that source.[51] EPA reviewed and largely concurred with the results of that analysis. As with Hill, the most cost-effective control measure at Kahului would be to reduce the amount of sulfur in the fuel. However, even that method is expensive. The lowest cost method for reducing SO_2 emissions at these plants is to switch to a fuel with no more than 1% sulfur by weight. To estimate the total cost of the converting this plant to 1% fuel oil and estimate the impact of those costs on electric rates, EPA developed a base case scenario derived from 2009 operating conditions.[52] This analysis, which is summarized in Table 19 below and further explained in our FIP TSD, indicates that the cost effectiveness of this control is approximately $4,200 per ton of SO_2 reduced.

[49] See FIP TSD Sections II.A., II.B, and III.B.

[50] Subject-to-Best Available Retrofit Technology (BART) Modeling for the State of Hawaii, Application of the CALPUFF Modeling System, March 3, 2010, Alpine Geophysics, LLC. This modeled impact is higher than the BART modeling for this source due to inclusion of additional non-BART-eligible units.

[51] BART Five-Factor Analysis Prepared for Hawaiian Electric Light Company, October 2010, Trinity Consultants.

[52] 2009 was selected because it was consistent with the year used in the BART analysis for Hill. It is also a year where the actual capacity factors for the electric plants on the Big Island were comparable to the 4-year average.

TABLE 19—COSTS AND BENEFITS FROM SWITCHING TO 1% SULFUR FUEL OIL

	Kahului
Baseline Weight % S	1.57
Baseline Fuel Consumption [gal/yr]	19,790,111
Baseline Emissions [tons SO_2/yr]	2,489
New Fuel Weight % S	1.00
Cost Differential [$/gal]	0.190
Controlled Emissions [tons SO_2/yr]	1,586
Annual Costs [$/yr]	3,760,121
Annual Emission Reductions [tons SO_2/yr]	904
Cost Efficiency [$/ton SO_2 reduced]	4,160

The second RP factor is the time necessary for compliance. The switch to a lower sulfur residual fuel oil than is currently being burned does not require any capital investment or construction, but it does require time to get new fuel contracts into place with the new sulfur limits. It may take time for the fuel suppliers to secure the new fuel and it will take time for the current fuel inventory to be consumed.

The third and fourth RP factors are the energy and non-air quality impacts of control measures and the remaining useful life of the source. EPA considered these factors in the context of the Hawaii Clean Energy Initiative that sets the goal of 70% clean energy by 2030. The Initiative includes the 2009 Clean Energy Omnibus Bill (ACT 155 (09), HB 1464, signed June 25, 2009). This statute calls for 30% reduction in energy use via efficiency and increases the renewable portfolio standard to 40% by 2030. EPA contracted with UNC and ICF to project the 2018 emissions of power plants considering the requirements of the Clean Energy Omnibus Bill. These projections are compared to the current 2018 projections based on the most recent Integrated Resource Plan (IRP) for Hawaii electric utilities. This IRP predates the 2009 bill and so does not account for its requirements. Table 20 compares the baseline emission projections for 2018, derived from the current IRP and the projections that take into account the goals of the Clean Energy Bill.

TABLE 20—RANGE OF 2018 EMISSIONS PROJECTIONS FOR KEY POWER PLANTS ON MAUI

	2018 SO_2 Emissions	2018 SO_2 Emissions
	IRP	Clean Energy Bill
Kahului Power Plant	2,822	0
Maalaea Generating Station	923	591

The projections based on the goals of the Clean Energy Bill assume that the energy conservation and renewable energy goals will be met in a more or less even fashion year to year. So, by 2018, most of these projects will be in place. Under this scenario, Kahului will cease operations by 2018 and Maalaea will operate at a significantly lower capacity factor and/or burn biofuels that contain much less sulfur than their current fuel.

c. Conclusion of Reasonable Progress Analysis for SO_2 Emissions on Maui

Based on the foregoing analysis for the four RP factors, we propose to determine that it is not reasonable to require additional SO_2 controls for point sources on Maui in this planning period. In addition, as mentioned above, electric utility rates in Hawaii are over three times the national average. Furthermore, mobile source SO_2 emissions are projected to decrease significantly on Maui, mostly due to the ECA. The net result is that overall SO_2 emissions are projected to decrease on Maui by nearly 8%. EPA proposes to find that this is a reasonable reduction for this planning period. Therefore, based on our consideration of the four RP factors, EPA proposes to determine that this level of emissions reduction is reasonable for this planning period.

5. Four Factor Analysis for SO_2 Emissions on the Big Island (Hawaii)

Unlike on Maui, EPA projects that, without additional controls, SO_2 emissions on the Big Island will increase by 3.9% between 2005 and 2018. As noted above, SO_2 is the key anthropogenic visibility-impairing pollutant at both of Hawaii's Class I areas. Therefore, we propose to determine that additional SO_2 control measures are needed on the Big Island in order to ensure reasonable progress toward the national goal of no anthropogenic visibility impairment.

a. Mobile Source SO_2 Emissions on the Big Island (Hawaii)

Mobile source emissions of SO_2 on the Big Island are projected to drop 91% under existing regulations, driven primarily by reductions in marine emissions due to the ECA. This control measure is in addition to the benefits of fleet turnover as described above in the discussion NO_X. Given the existing benefits from the ECA and the fleet turnover benefits and taking into account the four reasonable progress factors, EPA proposes to determine that no additional SO_2 reductions from mobile sources on the Big Island are needed in order to show reasonable progress during this first planning period.

b. Point Source SO_2 Emissions on the Big Island (Hawaii)

Point sources account for roughly 71% of the anthropogenic SO_2 emissions on the Big Island. See Table 17 above. Virtually all of these emissions come from electric power plants. See Table 21 below. Therefore, EPA considered all of the power plants on the Big Island as candidates for additional controls.

TABLE 21—HAWAII (BIG ISLAND) POINT SOURCE EMISSIONS

	2005		2018	
	NO_X	SO_2	NO_X	SO_2
HELCO—Kanoelehua Hill Generating Station	514	2,822	595	3,264
HELCO—Puna Power Plant	241	1,345	279	1,556
HELCO—Keahole Power Plant	154	157	178	182
HELCO—Shipman Power Plant	38	222	28	166
Pepeekeo Power Plant/9–16–10 Hu Honua Bioenergy			420	78
Tradewinds Forest Products, LLC			133	15
HELCO—Waimea Power Plant	89	5	103	5
Total	1,036	4,551	1,736	5,266

Because of their relatively low emission rates and distance from the Class I areas, EPA eliminated the Keahole and Waimea Power Plants and the Hu Honua Bioenergy facility. Due to their emission rates and positions close to and upwind of Hawaii Volcanoes NP, Hill, Shipman and Puna are the focus of the review. Alpine Geophysics estimated the visibility impact of these plants using the CalPUFF computer model. The results are summarized in Table 22.

TABLE 22—MODELED VISIBILITY IMPACTS OF KEY POWER PLANTS ON HAWAII

	Visibility Impact [delta dv]	
	HAVO	HALE
HELCO—Kanoelehua Hill Generating Station	2.334	0.808
HELCO—Puna Power Plant	1.594	0.358
HELCO—Shipman Power Plant	0.777	0.321

These plants were also modeled with the same conservative assumptions as Kahului. The results for Hill and Puna indicate that these plants may be causing visibility impairment at Hawaii Volcanoes. In addition, the results indicate that Hill may be contributing to impairment at Haleakala and Shipman may be contributing to visibility impairment at Hawaii Volcanoes. Therefore, we further analyzed each of these plants in relation to the four RP factors.

The first RP factor to consider is the cost of compliance. HECO (the electric utility) performed a detailed analysis of the cost of reducing SO_2 emissions at Hill as part of the BART analysis for that source.[53] EPA reviewed and largely concurred with the results of that analysis. As described previously, the most cost-effective control measure is to reduce the amount of sulfur in the fuel. This is also true for Shipman and Puna. Table 23 provides the full cost/benefit calculation for the Big Island sources. Based on this analysis, EPA estimates that the cost effectiveness of this control is approximately $5,500 per ton of SO_2 reduced for sources on the Big Island.

TABLE 23—COSTS AND BENEFITS FROM SWITCHING TO 1% SULFUR FUEL OIL

	Hill	Shipman	Puna
Baseline Weight % S	1.57	1.57	1.57
Baseline Fuel Consumption [gal/yr]	18,650,604	2,241,876	9,930,648
Baseline Emissions [tons SO_2/yr]	2,344	282	1,249
New Fuel Weight % S	1.00	1.00	1.00
Cost Differential [$/gal]	0.255	0.255	0.255
Controlled Emissions [tons SO_2/yr]	1493	180	796
Annual Costs [$/yr]	$4,755,904	$571,678	$2,532,315
Annual Emission Reductions [tons SO_2/yr]	851	102	454
Cost Efficiency [$/ton SO_2 reduced]	$5,587	$5,583	$5,583
Total Annual Cost	$7,859,89		
Total Annual Emissions Reduction	1,407		

In Table 23, most of the assumptions are the same as in Table 19, but the cost differential is a bit higher due to the extra transport costs. We added 0.065 $/gal to the estimate for a total of 0.255 $/gal. The 0.065 $/gal estimate is derived from the six-year (2006–2011) cost differential between residual fuel oil delivered to Maui and the same oil delivered to the Big Island.

With these assumptions, EPA estimates an annual increase in fuel

[53] BART Five-Factor Analysis Prepared for Hawaiian Electric Light Company, October 2010, Trinity Consultants.

costs of over $7.9 million/year. EPA contracted with the energy economics consulting firm Energy Strategies to estimate the impact of these increased fuel costs on electric rates.[54] Based on its analysis, these increased costs would translate into a roughly 2% increase in retail electric rates on the Big Island. This impact is higher than just controlling Hill alone because applying the controls to all three sources of concern would result in higher fuel costs for the system. The benefit of this change would be a reduction in SO_2 emissions of at least 1,400 tons per year.

The second factor to consider is the time necessary for compliance. The considerations here are the same as for Maui.

The third and fourth factors to consider are the energy and non-air quality impacts of control measures and the remaining useful life of the source. As part of our consideration of these two factors, EPA is taking into account the anticipated results of the Clean Energy Bill described above. Table 24 compares the emission projections for 2018 based on the IRP and the projections that take into account the goals of the Clean Energy Bill.[55]

TABLE 24—RANGE OF 2018 EMISSIONS PROJECTIONS FOR KEY POWER PLANTS ON THE BIG ISLAND

[Tons per year]

	2018 SO_2 emissions IRP	2018 SO_2 emissions Clean Energy Bill
HELCO—Kanoelehua Hill Generating Station	3,264	765
HELCO—Puna Power Plant	1,566	365
HELCO—Shipman Power Plant	166	0

Under the Clean Energy Bill scenario, Shipman is projected to cease operations by 2018 and Hill and Puna are projected to be operating at a significantly lower capacity factor and/or burning biofuels with a much lower sulfur content than their current fuel. However, as noted above, these projections are based on optimistic assumptions about implementation of the Clean Energy Bill. In addition, these requirements are not federally enforceable. Therefore, we cannot rely upon these projected reductions to demonstrate reasonable progress.

c. Conclusion of Reasonable Progress Analysis for SO_2 Emissions on the Big Island (Hawaii)

In summary, without further control, emissions of SO_2 on the Big Island are projected to increase by nearly 4% between 2005 and 2018. Therefore, additional, federally enforceable SO_2 reductions are needed on the Big Island to ensure reasonable progress. EPA has identified the fuel oil-fired boilers at Hill, Shipman and Puna as appropriate sources for further control because they are upwind of the Hawaii Volcanoes NP, have high SO_2 emissions and lack modern pollution controls. Based on our analysis of the four RP factors, EPA believes that the SO_2 control measure for these sources should be structured so that it can be achieved through increased energy efficiency and increased reliance on renewable energy.

Therefore, EPA is proposing to cap total emissions at the fuel oil-fired boilers at Hill, Shipman and Puna at 3,550 tons of SO_2 per year, beginning in January 1, 2018. This cap was derived from EPA's analysis of the costs of switching these units to 1% sulfur fuel as shown in Table 23 and is equivalent to a reduction of 1,400 tons of SO_2 per year from the total projected 2018 emissions from these units. EPA is structuring this control requirement to allow HECO to minimize costs. If HECO implements the Hawaii Clean Energy Bill on schedule, it should be able to meet this cap with no additional costs to the ratepayers. If the cap has to be met with a lower sulfur fuel oil, HECO should be able to meet this cap at a cost of roughly $7.9 million/year. We are taking the other three factors into account by structuring the control requirement to be consistent with the State's goals for energy conservation and reduced dependence on fossil fuels. Once this control measure is in place, total SO_2 emissions on Big Island will decrease by at least 17% in the first planning period. Considering the four factors as shown above, the EPA considers this reduction to constitute reasonable progress toward the goal of eliminating anthropogenic visibility impairment at the Class I areas.

d. Benefits of the Emission Control Area on Emissions from In Transit Marine Vessels

In addition to reducing emissions from ships in and near ports, the ECA also significantly reduces emissions from ships traveling from port-to-port. The projected effect of the ECA on this category of marine emissions is shown in Table 25. EPA considered this as supplemental information when determining whether reasonable progress is being made with existing regulations.

TABLE 25—BENEFITS OF THE ECA FROM IN TRANSIT SHIPPING WITHIN 150 KM OF THE CLASS I AREAS

Class I area	2005		2018	
	NO_X	SO_2	NO_X	SO_2
Haleakala	2,740	2,610	3,419	141
Hawaii Volcanoes	566	530	447	15

[54] Fuel Cost Screening Tool (r1 4–18–12), Energy Strategies Incorporated, April 18, 2012.

[55] Clean Energy Bill estimates from Email from Juanita Haydel, ICF Corporation to Greg Nudd, U.S. EPA Region 9, April 4, 2012, with spreadsheet titled: "*Hawaii Emissions Values_Revised_040412_FTC.xlsx*".

6. Reasonable Progress Goals—2018 Visibility Projections

As explained above, there is no modeling available for this planning period that can reliably predict the change in visibility due to changes in the emission inventory for all sources (shipping, mobile sources, point sources, etc.).[56] In the absence of reliable visibility modeling for 2018, EPA is using the island-specific inventories as a surrogate for judging whether reasonable progress is being made.

In order to show how the future emission changes may affect the aerosol levels in each of the Class 1 areas, EPA estimated the effect that the changes in the island-specific inventories for NO_X and SO_2 will have on the levels of nitrate and sulfate for each of the Class 1 areas. The details of this analysis are set forth in the TSD.

At Hawaii Volcanoes NP, the projected visibility for 2018 is slightly worse without the proposed FIP control measures. With the proposed FIP control measure, there is a slight improvement in visibility conditions compared to the year 2005 for both the 20% best and 20% worst days. At Haleakala NP, there is a slight improvement in visibility conditions compared to the year 2005 for both the 20% best and 20% worst days.

7. Visibility Improvement Compared to URP and Number of Years to Reach Natural Conditions

The amount of improvement needed to achieve the URP for 2018 at Haleakala NP is 1.38 delta deciview. Based on the projections of visibility, discussed above, the amount of improvement by 2018 would be 0.29 delta deciview. This would result in a 2018 level of visibility of 13.0 deciview at Haleakala.

The amount of improvement needed to achieve the URP for 2018 for Hawaii NP is 2.73 delta deciview. Based on the projections of visibility, discussed above, the amount of improvement by 2018 would be 0.18 delta deciview. This would result in a 2018 level of visibility of 18.7 deciview.

Therefore, the URP will not be met at either NP. Based on our analysis of the four reasonable progress factors above, we propose to determine that the rate of progress for the implementation plan to attain natural conditions by 2064 is not reasonable and that our progress goals are reasonable.

EPA has calculated the number of years it would take to reach natural conditions, based on the rate of visibility improvement in this first planning period. Because the baseline conditions include the effect of the emissions from the volcano, the calculation of number of years to reach natural conditions by control of anthropogenic emission does not represent a realistic scenario in this case. Based on the projected rate of improvement at Haleakala of 0.021 deciview per year, natural conditions would be met in 280 years. Based upon the projected rate of improvement at Hawaii Volcanoes NP, natural conditions would be met in over 800 years. If the volcano stops erupting, natural conditions would be met significantly sooner.

G. Long-Term Strategy

1. Interstate Consultation Requirement

Pursuant to 40 CFR 51.308(d)(3)(i), if a state has emissions that are reasonably anticipated to contribute to visibility impairment in any mandatory Class I Federal area located in another state or states, each of the relevant states must consult with the other(s). Hawaii lies approximately 2,390 miles southwest of the Continental United States and has been included by EPA in the regional haze program, ''because of the potential for emissions from sources within [its] borders to contribute to regional haze impairment in Class I areas also located within [Hawaii's] own jurisdiction,'' 64 FR at 35720 (emphasis added). Therefore, we propose to determine that emissions from Hawaii are not reasonably anticipated to contribute to visibility impairment in any mandatory Class I Federal area located in another state or states. We also propose to determine that no emissions from any other state are reasonably anticipated to contribute to visibility impairment in either of Hawaii's mandatory Class I Federal areas.

The Regional Haze Rule also requires any state that has participated in a regional planning process, to ''ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process'' and to demonstrate the technical basis for this apportionment. 40 CFR 51.308(d)(3)(ii) and (iii). As noted above, both EPA and the state of Hawaii participated in the WRAP. The WRAP did not identify any obligation for emission reductions on the part of Hawaii. Therefore, we propose to determine that no additional emissions reductions are necessary in Hawaii to meet the progress goal for any mandatory Class I Federal area outside of Hawaii.

2. Identification of Anthropogenic Sources of Visibility Impairment

Pursuant to 40 CFR 51.308(d)(3)(iv), States are required to identify all anthropogenic sources of visibility impairment considered in developing the long-term strategy, including major and minor stationary sources, mobile sources, and area sources. As explained in section III.C above, we have considered each of these categories in developing our long-term strategy.

3. Other Long Term-Strategy Requirements

The RHR requires that a state consider the following factors in developing an LTS: (a) Emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (b) measures to mitigate the impacts of construction activities; (c) emissions limitations and schedules for compliance to achieve the RPG; (d) source retirement and replacement schedules; (e) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes; (f) enforceability of emissions limitations and control measures; and (g) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the LTS. 40 CFR 51.308(d)(3)(v). We address each of the factors below.[57]

a. Emissions Reductions Due to Ongoing Air Pollution Programs

Our LTS incorporates emission reductions due to a number of ongoing air pollution control programs.

i. Prevention of Significant Deterioration Rules

One of the primary regulatory tools for addressing visibility impairment from industrial sources under the Act is the Prevention of Significant Deterioration (PSD) program. The PSD requirements apply to new major sources and major sources making a major modification in attainment areas.[58] Among other things, the PSD

[56] As described above, there is acceptable modeling for point sources for the BART and the reasonable progress analysis for point sources.

[57] Our analysis of these factors relies in part on work performed by our contractors, UNC and ICF, which is summarized in a document entitled, ''Technical Analysis for Arizona and Hawaii Regional Haze FIPs: Task 17: Information and Analysis to Support Hawaii's Long-Term Strategy'' (April 13, 2012) (hereinafter ''Hawaii LTS Report''). The Hawaii LTS Report is available in the docket for this action.

[58] Nonattainment New Source Review (NSR) requirements apply to new major sources and major sources making major modifications in nonattainment areas. Hawaii has no nonattainment

Continued

permit program is designed to protect air quality and visibility in Class 1 Areas by requiring best available control technology (BACT) and involving the public in permit decisions. EPA has promulgated a PSD FIP for Hawaii to address the CAA's PSD requirements. See 40 CFR 52.632(b) (''PSD FIP''). DOH has been delegated authority to implement this FIP since 1983. The FIP provides procedures, including requirements for input from the relevant FLM, for considering potential visibility impacts to Class I areas from new major stationary source or major modifications of existing major stationary sources. *See* 40 CFR 52.21(p)(1).

ii. Reasonably Attributable Visibility Impairment Rules

EPA has promulgated a FIP for Hawaii, which incorporates the provisions of 40 CFR 52.26, 52.27, 52.28, 52.29, to address RAVI in Hawaii. *See* 40 CFR 52.633. There have been no certifications of RAVI in the Hawaii Class I areas, nor are any Hawaii sources affected by the RAVI provisions at this time.

iii. On-going Implementation of Federal Mobile Source Rules

Mobile source NO_X and SO_2 emissions are expected to decrease in Hawaii from 2002 to 2018, due to several existing federal mobile source regulations. As shown in Table 26, these rules will result in significant reductions in NO_X and SO_2 emissions from both on road and non-road mobile sources.

TABLE 26—STATEWIDE INVENTORY OF NO_X AND SO_2 EMISSIONS FROM ON-ROAD AND NON-ROAD MOBILE SOURCES: 2005, 2008 AND 2018 [59]

Source category	2005		2008		2018	
	NO_X	SO_2	NO_X	SO_2	NO_X	SO_2
On-Road Mobile Sources	20,642	321	14,239	97	5,058	72
Non-Road Mobile Sources	4,750	534	4,573	78	3,090	7

iv. North American Emissions Control Area

An additional air pollution control program that will limit emissions of visibility-impairing pollutants in Hawaii is the North American Emissions Control Area (NA ECA). The United States Government, together with Canada and France, established the NA ECA under the auspices of Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL Annex VI), a treaty developed by the International Maritime Organization. This ECA will require use of lower sulfur fuels in ships operating within 200 nautical miles of the majority of the U.S. and Canadian coastline, including the U.S. Gulf Coast and Hawaii, beginning in August 2012. The ECA is expected to significantly reduce both NO_X and SO_2 emissions from marine sources in Hawaii during the first implementation period. These reductions are reflected in Table 27.

TABLE 27—STATEWIDE INVENTORY OF NO_X AND SO_2 EMISSIONS FROM MARINE SOURCES: 2005, 2008 AND 2018 [60]

Source category	2005		2008		2018	
	NO_X	SO_2	NO_X	SO_2	NO_X	SO_2
In and Near Port Marine	2,572	2,201	12,432	2,638	2,097	117
Underway Marine (<30nm)	3,052	1,418	562	282	1,867	68

b. Measures to Mitigate the Impacts of Construction Activities

Potential sources of emissions from construction activities include exhaust from fuel-burning equipment on the site; vehicles working on the site, delivering materials, and hauling away excavate; employee vehicles; and fugitive dust from exposed earth, material stockpiles, and vehicles on roadways, especially unpaved site accesses. These activities can result in emissions of NO_X, SO_X, particulate matter (PM_{10} and $PM_{2.5}$ from engine exhaust and as fugitive dust from roadways and material handling) and primary organic aerosols.[61]

Hawaii DOH regulates emissions of air pollutants, including construction emissions, under Chapter 11–60.1 of Hawaii Administrative Rules (HAR). These rules generally prohibit the emission of any ''regulated air pollutant'' without the written approval of DOH. HAR § 11–60.1–2.[62] ''Regulated air pollutant'' is defined to include, among other things, NO_X, VOCs and ''any air pollutant for which a national or state ambient air quality standard has been promulgated'' (e.g., SO_2, PM_{10} and $PM_{2.5}$). HAR § 11–60.1–2.[63] Fugitive dust emissions are specifically regulated under HAR § 11–60.1–33,[64] which requires the use of ''reasonable precautions'' to mitigate the impacts of visible fugitive dust. ''Fugitive dust'' is defined as ''the emission of solid airborne particulate matter from any source other than combustion.'' HAR § 11–60.1–1.

areas at this time and therefore the nonattainment NSR requirements are not relevant.

[59] Excerpted from FIP TSD Table III–3.

[60] Excerpted from FIP TSD Table III–3.

[61] See Hawaii LTS Report, §§ 2.2.

[62] The Hawaii SIP currently contains an earlier version of this rule, HAR § 11–60–17. See 40 CFR 52.620(c) (2011). EPA has proposed to replace the old rule with HAR § 11–60.1–2. See 77 FR 25111 (April 27, 2012).

[63] The Hawaii SIP currently contains an earlier version of this rule, HAR § 11–60–1. See 40 CFR 52.620(c) (2011). EPA has proposed to replace the old rule with HAR § 11–60.1–1. See 77 FR 25111 (April 27, 2012).

[64] The Hawaii SIP contains an earlier version of this rule, HAR § 11–60–26. See 40 CFR 52.620(c) (2011).

In addition to fugitive dust, another potential source of visibility-impairing pollutants from construction activities is fuel-burning construction equipment and vehicles. Emissions from construction equipment are reflected in the non-road mobile source category of the Hawaii Emissions Inventory,[65] while emissions from trucks and other construction-related vehicles are reflected in the on-road category.[66] As described in section III.C above, statewide NO_X and SO_2 from the on-road and non-road mobile source categories are expected to decrease significantly between 2005 and 2018, as new federal mobile source regulations are implemented. In addition to the federal mobile source regulations, emissions from motor vehicles are regulated under HAR § 11–60.1–34.[67]

Given the significant decreases in this category expected from ongoing pollution control measures, we propose that no additional measures are needed to mitigate the impact of construction activities during this time period. However, as noted above, coarse mass contributes to 9% of the visibility degradation on the 20% worst days and 17% on the 20% best days at Haleakala. It is unknown how much of this coarse mass derives from fugitive dust emissions. Therefore, for the next planning period, a detailed study of the source contribution to coarse mass and soil measured at the Haleakala Crater Class 1 area monitors is needed. Depending on the results of this study, further regulation of fugitive dust emissions, including construction emissions, may be appropriate.

c. Emission Limitations and Schedules for Compliance

As explained above, we are proposing to place a 3,550 tpy cap on SO_2 emissions from the residual fuel-fired boilers at Hill, Shipman and Puna on the Big Island, which represents a 1,400 tpy reduction from the 2018 projected emission from these units. We propose that this emission limit, together with the ongoing requirements described above, will be sufficient to meet the RPGs for the first implementation period.

d. Sources Retirement and Replacement Schedules

In order to assess potential source retirements and replacements during the first implementation period, our contractor, ICF, reviewed the last set of Integrated Resource Plans (IRPs) for HECO and its subsidiaries. In its IRP, HECO indicated that Wauai Units 3 and 4 would be placed into emergency reserve or retired in 2011 and 2014, respectively. HELCO, MECO, and Kauai Island Utility Cooperative (KIUC) had no plans to retire any of their units in their last IRP.[68]

It should be noted, however, that existing state legislation and voluntary measures by the Hawaiian utilities are likely to result in further reductions in oil-fired electricity generating units in Hawaii by 2018. In particular, Hawaii's current Renewable Portfolio Standard (RPS) requires each electric utility company in the state to achieve the following percentages of renewable electrical energy sales:

- 10% of its net electricity sales by December 31, 2010;
- 15% of its net electricity sales by December 31, 2015;
- 25% of its net electricity sales by December 31, 2020; and
- 40% of its net electricity sales by December 31, 2030.[69]

Although the Hawaii RPS is a state law and is not federally enforceable, it is likely to result in significant reductions in SO_2 and NO_X emissions over the next twenty years, as existing fossil fuel-fired generation is replaced with renewables.

In addition, as part of the Hawaii Clean Energy Initiative, the State of Hawaii, Division of Consumer Advocacy of the Department of Commerce & Consumer Affairs, and the Hawaiian Electric Companies have entered into an ''Energy Agreement'', which includes an extensive list of renewable energy commitments and related provisions.[70] Among other things, the Agreement provides that, ''the utilities will 'retire' the older and less efficient fossil-fired firm capacity generating units by removing such units from normal daily operating service as expeditiously as possible.'' [71] Although this is not a federally enforceable requirement, we expect that the output of the utilities' existing oil-fired units will decrease over the period of the first implementation period and will be replaced by renewable energy generation.

e. Agricultural and Forestry Smoke Management Techniques

Hawaii's agricultural fire emissions come from crop waste combustion of over roughly 30,000 acres of sugarcane, which is cultivated mostly on Maui. Burn permits are required under HAR § 11–60.1–53 [72] and records must be kept in accordance with such permits under HAR § 11–60.1–56.[73] While there is no smoke management plan as such, widespread and persistent haze conditions are used as a criterion for establishment of a ''no-burn'' period by Hawaii DOH. See HAR § 11–60.1–55.[74] Given our focus on SO_2 as the dominant visibility-impairing pollutant for this implementation period, and our finding that there is no evidence of agricultural burning contributing to haze at Class I areas,[75] we propose to determine that no further controls on agricultural burning or forest fires are reasonable at this time.

f. Enforceability of Control Measures

40 CFR 51.308(d)(3)(v)(F) of the Regional Haze Rule requires us to ensure that emission limitations and control measures used to meet RPGs are enforceable. As described above, we are proposing that cumulative SO_2 emissions from the residual fuel fired boilers at the Hill, Shipman and Puna plants be limited to 3,550 tons per year (tpy) (rolling 12-month average). We propose that enforceability of this control measure will be ensured through the following measurement, recordkeeping and reporting requirements:

The sources will be required to measure the sulfur content (weight percent), heat value (million British thermal units per gallon (MMBtu/gal)) and total gallons of fuel burned at each of the affected units. Based on these

[65] ''Final Emission Inventory Report: Data Population for Air System for Hawaii Emissions Data (AirSHED)'', Environ International Corporation, (April 12, 2010) (hereinafter ''Environ Inventory'') Appendix D, Figures 2, 3 and 4.

[66] ''Technical Analysis for Hawaii's Regional Haze FIP Report—Task 16: On-Road Mobile Emissions Inventory'', ICF International, March 23, 2012.

[67] The Hawaii SIP currently contains an earlier version of this rule, HAR § 11–60–25. See 40 CFR 52.620(c) (2011). EPA has proposed to replace the old rule with HAR § 11–60.1–34. See 77 FR 25111 (April 27, 2012).

[68] Technical Analysis for Arizona and Hawaii Regional Haze FIPs: Task 17: Information and Analysis to Support Hawaii's Long-Term Strategy University of North Carolina at Chapel Hill, ICF International, April 13, 2012.

[69] HRS § 269–92.

[70] ''Energy Agreement Among the State of Hawaii, Division of Consumer Advocacy of the Department of Commerce & Consumer Affairs, and Hawaiian Electric Companies.'' (Oct. 2008) (hereinafter ''Energy Agreement'').

[71] Section 11 of the Energy Agreement.

[72] The Hawaii SIP currently contains an earlier version of this rule, HAR § 11–60–19. See 40 CFR 52.620(c) (2011). EPA has proposed to replace the old rule with HAR § 11–60.1–53. See 77 FR 25111 (April 27, 2012).

[73] The Hawaii SIP currently contains an earlier version of this rule, HAR § 11–60–22. See 40 CFR 52.620(c) (2011). EPA has proposed to replace the old rule with HAR § 11–60.1–56. See 77 FR 25111 (April 27, 2012).

[74] The Hawaii SIP contains an earlier version of this rule, HAR § 11–60–21. See 40 CFR 52.620(c) (2011).

[75] See FIP TSD Sections II.A, II.B and III.B.

parameters, the SO_2 emissions for each unit will be calculated on a monthly basis, then the rolling 12-month average of the total emissions for all units will be calculated. All of this information must be recorded and these records must be maintained for at least five years. In addition, all of this information must be reported to Hawaii DOH and EPA on an annual basis. Finally, any exceedance of the 3,550 tpy cumulative emission limit for these 5 units must be reported to Hawaii DOH and EPA within 30 days.

g. Anticipated Net Effect on Visibility Due to Projected Changes in Point, Area, and Mobile Source Emissions over the next 10 years

As described above, total statewide anthropogenic emissions of NO_X and VOC are projected to decrease between 2005 and 2018. However, anthropogenic SO_2 emissions are expected to increase between 2005 and 2018, largely due to increased emissions from point sources.

Our analysis of the monitoring data indicates that visibility impacts of SO_2 emissions are of greater concern in Hawaii's Class I areas than the impacts of either NO_X or VOC. The increase in anthropogenic SO_2 emissions indicates that some additional pollution reductions are needed to ensure reasonable progress toward the goal of eliminating anthropogenic visibility impairment in Hawaii's mandatory class I areas. Our proposal to achieve these reductions is explained in section III.F.5 of this notice.

H. Coordination of RAVI and Regional Haze Requirements

Our visibility regulations direct states to coordinate their RAVI LTS and monitoring provisions with those for regional haze, as explained in section IV.G, above. Under our RAVI regulations, the RAVI portion of a state SIP must address any integral vistas identified by the FLMs pursuant to 40 CFR 51.304. *See* 40 CFR 51.302. An *integral vista* is defined in 40 CFR 51.301 as a ''view perceived from within the mandatory Class I federal area of a specific landmark or panorama located outside the boundary of the mandatory Class I federal area.'' Visibility in any mandatory Class I Federal area includes any integral vista associated with that area. The FLMs did not identify any integral vistas in Hawaii. In addition, there have been no certifications of RAVI in the Hawaii Class I areas, nor are any Hawaii sources affected by the RAVI provisions.

Because Hawaii has not submitted a SIP to address RAVI, EPA previously promulgated a FIP for Hawaii, which incorporates the provisions of 40 CFR 52.26, 52.27, 52.28, 52.29 to address RAVI. We propose to find that the Regional Haze FIP appropriately supplements and augments EPA's FIP for RAVI visibility provisions by updating the monitoring and LTS provisions to address regional haze. We discuss the relevant monitoring provisions further below.

I. Monitoring Strategy

40 CFR 51.308(d)(4) requires that the FIP contain a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment that is representative of all mandatory Class I Federal areas within the state. This monitoring strategy must be coordinated with the monitoring strategy required in 40 CFR 51.305 for RAVI. As 40 CFR 51.308(d)(4) notes, compliance with this requirement may be met through participation in the IMPROVE network. 40 CFR 51.308(d)(4)(i) further requires the establishment of any additional monitoring sites or equipment needed to assess whether RPGs to address regional haze for all mandatory Class I Federal areas within the state are being achieved. Consistent with EPA's monitoring regulations for RAVI and regional haze, EPA will rely on the IMPROVE network for compliance purposes, in addition to any RAVI monitoring that may be needed in the future. Further information on monitoring methods and monitor locations can be found in the docket.[76] [77] The most recent report also can be found in the docket.[78] Therefore, we propose to find that we have satisfied the requirements of 40 CFR 51.308(d)(4) enumerated in this paragraph.

Currently there are two IMPROVE monitoring sites operating in or near the Haleakala NP. The Haleakala (HALE1) IMPROVE monitoring site is located outside of the Haleakala NP near the Maui Central Valley, at an elevation of 1153 meters. The HALE1 IMPROVE monitoring site began operation at end of 2000, and will end operation in May, 2012. The Haleakala Crater (HACR1) IMPROVE monitoring site is at the park's Western boundary, at an elevation of 2158 meters. The HACR1 IMPROVE monitoring site began operation in 2007. In this proposal, EPA is proposing to use monitoring data from the HALE1 monitoring site as a basis for establishing baseline visibility, because the HACR1 site was not yet in operation for the base year time period of 2000–2004. Future regional haze planning efforts need to be based on data collected at the HACR1 site.

Hawaii DOH has prepared two reports comparing the two IMPROVE monitoring sites at Haleakala NP,[79] including a detailed comparison of organic and elemental carbon data at the two sites.[80] The reports find that the most significant difference between data measured at the two sites appears to be that the HALE1 site has higher levels of organic and elemental carbon. The levels of the other species are generally lower at the HACR1 IMPROVE monitoring site than at the HALE1 monitoring site. The reports conclude that, based on the available data, the HACR1 IMPROVE monitoring site is more representative of visibility conditions within the Haleakala NP than the HALE1 IMPROVE monitoring site.

J. Federal Land Manager Consultation and Coordination

Under section 169A(d) of the Clean Air Act, we are required to consult with the appropriate FLM(s) before holding a public hearing on the Hawaii Regional Haze FIP. We must also include a summary of the FLMs' conclusions and recommendations in this notice. Both EPA and Hawaii DOH have consulted informally with the FLMs throughout the development of the Hawaii Regional Haze FIP. Most recently, we consulted with the FLMs by phone on March 26 and April 5, 2012.

In addition, 40 CFR 51.308(i)(4) specifies the regional haze FIP must provide procedures for continuing consultation with the FLMs on the implementation of the visibility protection program required by 40 CFR subpart P, including development and review of implementation plan revisions and 5-year progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in mandatory Class I Federal areas. We intend to continue to consult with the FLMs

[76] ''Visibility Monitoring Guidance,'' EPA–454/R–99–003, June 1999, *http://www.epa.gov/ttn/amtic/files/ambient/visible/r-99-003.pdf.*

[77] ''Guidance for Tracking Progress Under the Regional Haze Rule,'' EPA–454/B–03–004, September 2003, available at *http://www.epa.gov/ttncaaa1/t1/memoranda/rh_tpurhr_gd.pdf.* Figure 1–2 shows the monitoring network on a map, while Table A–2 lists Class I areas and corresponding monitors.

[78] ''Spatial and Seasonal Patterns and Temporal Variability of Haze and its Constituents in the United States,'' Report V, ISSN 0737–5352–87, June 2011.

[79] Comparison of Haleakala NP HALE1 and HACR1 IMPROVE Monitoring Site 2007–2008 Data Sets, March 30, 2012, State of Hawaii, Department of Health, Clean Air Branch.

[80] Review of VIEWS2.0 2009–2010 Haleakala National Park Organic and Elemental Carbon Data, March 30, 2012, State of Hawaii, Department of Health, Clean Air Branch.

regarding all aspects of the visibility protection program and we encourage Hawaii to do the same.

IV. Proposed Action

EPA is proposing to establish an emissions cap of 3,550 tons of SO_2 per year from the fuel oil-fired boilers at Hill, Shipman and Puna, beginning in January 1, 2018. This represents a reduction of 1,400 tons per year from the total projected 2018 annual emissions of SO_2 from these facilities. We propose to determine that this control measure, in conjunction with SO_2 and NO_X emissions control requirements that are already in place, will ensure that reasonable progress is made during this first planning period toward the national goal of no anthropogenic visibility impairment by 2064 at Hawaii's two Class I areas.

V. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

This proposed action is not a ''significant regulatory action'' under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011). The proposed Hawaii Regional Haze FIP requires implementation of emissions controls for SO_2 on specific units at three sources. Since EPA is proposing direct emission controls on selected units at only three sources, the Hawaii Regional Haze FIP is not a rule of general applicability.

B. Paperwork Reduction Act

This proposed action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* Under the Paperwork Reduction Act, a ''collection of information'' is defined as a requirement for ''answers to * * * identical reporting or recordkeeping requirements imposed on ten or more persons. * * * '' 44 U.S.C. 3502(3)(A). Because the proposed FIP applies to just three facilities, the Paperwork Reduction Act does not apply. See 5 CFR 1320(c).

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid Office of Management and Budget (OMB) control number. The OMB control numbers for our regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's proposed rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this proposed action on small entities, I certify that this proposed action will not have a significant economic impact on a substantial number of small entities. The three sources in question are electric generating plants that are owned by the Hawaii Electric Light Company, Inc. (HELCO), which is an electric utility subsidiary of HECO. Pursuant to 13 CFR 121.201, footnote 1, an electric utility firm is small if, including its affiliates, it is primarily engaged in the generation, transmission, and/or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million megawatt hours (MWH). In the fiscal year ended December 31, 2011, HELCO generated or purchased a total of 1,186.6 MWH.[81] Therefore, it is not a small business.

D. Unfunded Mandates Reform Act (UMRA)

This rule does not contain a Federal mandate that may result in expenditures that exceed the inflation-adjusted UMRA threshold of $100 million by State, local, or Tribal governments or the private sector in any 1 year. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments.

E. Executive Order 13132: Federalism

The proposed Hawaii Regional Haze FIP does not have federalism implications. This action will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. In this action, EPA is fulfilling its statutory duty under CAA Section 110(c) to promulgate a Regional Haze FIP following its finding that Hawaii had failed to submit a regional haze SIP. Thus, Executive Order 13132 does not apply to this action. In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This proposed rule does not have tribal implications, as specified in Executive Order 13175. It will not have substantial direct effects on tribal governments. Thus, Executive Order 13175 does not apply to this rule.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets EO 13045 as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it

[81] Hawaiian Electric Industries, Inc. and Hawaiian Electric Company, Inc., Form 10–K for the fiscal year ended December 31, 2011 ''Generation Statistics.''

implements specific standards established by Congress in statutes. However, to the extent this proposed rule will limit emissions of SO_2, the rule will have a beneficial effect on children's health by reducing air pollution.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12 of the National Technology Transfer and Advancement Act (NTTAA) of 1995 requires Federal agencies to evaluate existing technical standards when developing a new regulation. To comply with NTTAA, EPA must consider and use ''voluntary consensus standards'' (VCS) if available and applicable when developing programs and policies unless doing so would be inconsistent with applicable law or otherwise impractical. EPA believes that VCS are inapplicable to this action. Today's action does not require the public to perform activities conducive to the use of VCS.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994), establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

We have determined that this proposed rule, if finalized, will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population.

List of Subjects in 40 CFR Part 52

Air pollution control, Environmental protection, Intergovernmental relations, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides.

Dated: May 14, 2012.

Jared Blumenfeld,

Regional Administrator, Region 9.

For the reasons stated in the preamble, part 52 of title 40, chapter I, of the Code of Federal Regulations is proposed to be amended as follows:

PART 52—[AMENDED]

1. The authority citation for Part 52 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart M—Hawaii

2. Section 52.633 is amended by adding paragraph (d) to read as follows:

§ 52.633 Visibility protection.

* * * * *

(d) Regional Haze Plan Provisions.

(1) *Applicability.* This paragraph (d) applies to the following electric generating units (EGUs) and boilers: Kanoelehua Hill Generating Station, Hill 5 and Hill 6; Puna Power Plant, Boiler 1; Shipman Power Plant, Boiler S–3 and Boiler S–4.

(2) *Definitions.* Terms not defined below shall have the meaning given to them in the Clean Air Act or EPA's regulations implementing the Clean Air Act. For purposes of this paragraph (d):

SO_2 means sulfur dioxide.

Owner/operator means any person who owns, leases, operates, controls, or supervises an EGU or boiler identified in paragraph (d)(1).

Unit means any of the EGUs or boilers identified in paragraph (d)(1).

(3) *Emissions cap.* The EGUs identified in paragraph (d)(1) shall not emit or cause to be emitted SO_2 in excess of a total of 3,550 tons per year, calculated as the sum of total SO_2 emissions for all five units over a rolling 12-month period.

(4) *Compliance date.* Compliance with the emissions cap and other requirements of this section is required at all times on and after January 1, 2018.

(5) *Monitoring, recordkeeping and reporting requirements.*

(i) All records, including support information, required by this paragraph (5) shall be maintained for at least five (5) years from the date of the measurement, test or report. These records shall be in a permanent form suitable for inspection and made available to EPA, the Hawaii Department of Health or their representatives upon request.

(ii) The owners and operators of the EGUs identified in paragraph (d)(1) shall maintain records of fuel deliveries identifying the delivery dates and the type and amount of fuel received. The fuel to be fired in the boilers shall be sampled and tested in accordance with the most current American Society for Testing and Materials (ASTM) methods.

(iii) The owners and operators of the EGUs identified in paragraph (d)(1) shall analyze a representative sample of each batch of fuel received for its sulfur content and heat value following ASTM D4057. The samples shall be analyzed for the total sulfur content of the fuel using ASTM D129, or alternatively D1266, D1552, D2622, D4294, or D5453.

(iv) The owners and operators of the EGUs identified in paragraph (d)(1) shall calculate on a monthly basis the SO_2 emissions for each unit for the preceding month based on the sulfur content, heat value and total gallons of fuel burned fired.

(v) The owners and operators of the EGUs identified in paragraph (d)(1) shall calculate on a monthly basis the total emissions for all units for the preceding twelve (12) months.

(vi) The owners and operators of the EGUs identified in paragraph (1) shall notify the Hawaii Department of Health and EPA Region 9 of any exceedance of the emission cap in paragraph (d)(3) within thirty (30) days of such exceedance.

(vii) Within sixty (60) days following the end of each calendar year, the owners and operators of the EGUs identified in paragraph (d)(1) shall report to the Hawaii Department of Health and EPA Region 9 the total tons of SO_2 emitted from all units for the preceding calendar year by month and the corresponding rolling 12-month total emissions for all units.

(viii) Any document (including reports) required to be submitted by this rule shall be certified as being true, accurate, and complete by a responsible official and shall be mailed to the following addresses:

Clean Air Branch, Environmental Management Division, State of Hawaii Department of Health, P.O. Box 3378, Honolulu, HI 96801–3378,

and

Director of Enforcement Division, U.S. EPA Region IX, 75 Hawthorne Street, San Francisco, CA 94105.

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