ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R06–OAR–2021–0539; FRL–12282–01–R6]

Air Quality State Implementation Plans; Partial Approval, Partial Disapproval and Promulgation; Texas; Regional Haze

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to partially approve and partially disapprove the regional haze State implementation plan (SIP) revision submitted by Texas on July 20, 2021, under the Clean Air Act (CAA) and EPA's Regional Haze Rule (RHR) for the program's second implementation period. Texas's SIP submission addresses the requirement that states must periodically revise their long-term strategies for making reasonable progress towards the national goal of preventing any future, and remedying any existing, anthropogenic impairment of visibility, including regional haze, in mandatory Class I Federal areas. The SIP submission also addresses other applicable requirements for the second implementation period of the regional haze program. The EPA is taking this action pursuant to sections 110 and 169A of the Clean Air Act.

DATES: Written comments must be received on or before November 14, 2024.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–R06–OAR–2021–0539 at *https://www.regulations.gov.* Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from *Regulations.gov*. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets.* For additional submission methods, please contact the person identified in the **FOR FURTHER INFORMATION CONTACT** section. For the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets.*

Docket: The index to the docket for this action is available electronically at *www.regulations.gov.* While all documents in the docket are listed in the index, some information may not be publicly available due to docket file size restrictions or content (*e.g.,* CBI).

FOR FURTHER INFORMATION CONTACT: Jennifer Huser, U.S. Environmental Protection Agency, Region 6, 1201 Elm St., Suite 500, Dallas, Texas 75270, at (214) 665–7347, or by email at *Huser.Jennifer@epa.gov.*

SUPPLEMENTARY INFORMATION: Throughout this document wherever ''we,'' ''us,'' or ''our'' is used, we mean the EPA.

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I. What action is the EPA proposing?

On July 20, 2021, the Texas Commission on Environmental Quality (TCEQ) submitted a plan (''2021 Texas Regional Haze Plan'' or ''Texas RH SIP'') to the EPA to satisfy the regional haze program requirements pursuant to CAA sections 169A and 40 CFR 51.308. The EPA is proposing to partially approve and partially disapprove Texas's Regional Haze plan for the second planning (implementation) period. Consistent with section 110(k)(3) of the CAA, the EPA may partially approve portions of a submittal if those elements meet all applicable requirements and may disapprove the remainder so long as the elements are fully separable.[1] As required by section 169A of the CAA, the Federal RHR calls for State and Federal agencies to work together to improve visibility in 156 national parks and wilderness areas. The rule requires the states, in coordination with the EPA, National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), Forest Service (FS), and other interested parties, to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment. Visibility impairing pollutants include fine and coarse particulate matter (PM) (*e.g.,* sulfates, nitrates, organic carbon, elemental carbon, and soil dust) and their precursors (*e.g.,* sulfur dioxide (SO_2), nitrogen oxides (NO_X), and, in some cases, volatile organic compounds (VOC) and ammonia (NH_3)). As discussed in further detail below, the EPA is proposing to find that Texas has submitted a Regional Haze plan that does not meet all the Regional Haze requirements for the second planning period. For the reasons described in this document, the EPA is proposing to approve the elements of Texas's plan related to requirements contained in 40

[1] *See* CAA section 110(k)(3) and July 1992 EPA memorandum titled ''Processing of State Implementation Plan (SIP) Submittals'' from John Calcagni, at *https://www.epa.gov/sites/default/files/2015-07/documents/procsip.pdf.*

CFR 51.308(f)(1), (f)(4), (f)(5),[2] and (f)(6). The EPA is proposing to disapprove the elements of Texas's plan related to requirements contained in 40 CFR 51.308(f)(2), (f)(3), and (i). The State's submission can be found in the docket for this action.

II. Background and Requirements for Regional Haze Plans

A. Regional Haze Background

In the 1977 CAA Amendments, Congress created a program for protecting visibility in the nation's mandatory Class I Federal areas, which include certain national parks and wilderness areas.[3] CAA 169A. 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 which impairment results from manmade air pollution.'' CAA 169A(a)(1). The CAA further directs the EPA to promulgate regulations to assure reasonable progress toward meeting this national goal. CAA 169A(a)(4). On December 2, 1980, the EPA promulgated regulations to address visibility impairment in mandatory Class I Federal areas (hereinafter referred to as ''Class I areas'') that is ''reasonably attributable'' to a single source or small group of sources. (45 FR 80084, December 2, 1980). These regulations, codified at 40 CFR 51.300 through 51.307, represented the first phase of the EPA's efforts to address visibility impairment. In 1990, Congress added section 169B to the CAA to further address visibility impairment, specifically, impairment from regional haze. CAA 169B. The EPA promulgated the RHR, codified at 40 CFR 51.308,[4] on July 1, 1999. (64 FR 35714, July 1, 1999). These regional haze regulations are a central component of the EPA's comprehensive visibility protection program for Class I areas.

Regional haze is visibility impairment that is produced by a multitude of anthropogenic sources and activities which are located across a broad geographic area and that emit pollutants that impair visibility. Visibility impairing pollutants include fine and coarse particulate matter (PM) (*e.g.,* sulfates, nitrates, organic carbon, elemental carbon, and soil dust) and their precursors (*e.g.,* sulfur dioxide (SO_2), nitrogen oxides (NO_X), and, in some cases, volatile organic compounds (VOC) and ammonia (NH_3)). Fine particle precursors react in the atmosphere to form fine particulate matter ($PM_{2.5}$), which impairs visibility by scattering and absorbing light. Visibility impairment reduces the perception of clarity and color, as well as visible distance.[5]

To address regional haze visibility impairment, the 1999 RHR established an iterative planning process that requires both states in which Class I areas are located and states ''the emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility'' in a Class I area to periodically submit SIP revisions to address such impairment. CAA 169A(b)(2);[6] see also 40 CFR 51.308(b), (f) (establishing submission dates for iterative regional haze SIP revisions); (64 FR at 35768, July 1, 1999). Under the CAA, each SIP submission must contain ''a long-term (ten to fifteen years) strategy for making reasonable progress toward meeting the national goal,'' CAA 169A(b)(2)(B); the initial round of SIP submissions also had to address the statutory requirement that certain older, larger sources of visibility impairing pollutants install and operate the best available retrofit technology (BART). CAA 169A(b)(2)(A); 40 CFR 51.308(d), (e). States' first regional haze SIPs were due by December 17, 2007, 40 CFR 51.308(b), with subsequent SIP submissions containing updated long-term strategies originally due July 31, 2018, and every ten years thereafter. (64 FR at 35768, July 1, 1999). The EPA established in the 1999 RHR that all states either have Class I areas within their borders or ''contain sources whose emissions are reasonably anticipated to contribute to regional haze in a Class I area''; therefore, all states must submit regional haze SIPs.[7] *Id.* at 35721.

Much of the focus in the first implementation period of the regional haze program, which ran from 2007 through 2018, was on satisfying states' BART obligations. First implementation period SIPs were additionally required to contain long-term strategies for making reasonable progress toward the national visibility goal, of which BART is one component. The core required elements for the first implementation period SIPs (other than BART) are laid out in 40 CFR 51.308(d). Those provisions required that states containing Class I areas establish reasonable progress goals (RPGs) that are measured in deciviews and reflect the anticipated visibility conditions at the end of the implementation period including from implementation of states' long-term strategies. The first planning period RPGs were required to provide for an improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period. In establishing the RPGs for any Class I area in a State, the State was required to consider four statutory factors: the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected sources. CAA 169A(g)(1); 40 CFR 51.308(d)(1).

States were also required to calculate baseline (using the five year period of 2000–2004) and natural visibility conditions (*i.e.,* visibility conditions without anthropogenic visibility

[2] 40 CFR 51.308(f)(5) requires that the second planning period SIP revision address the requirements listed in (g)(1) through (g)(5).

[3] Areas statutorily designated as mandatory Class I Federal areas consist of national parks exceeding 6,000 acres, wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks that were in existence on August 7, 1977. CAA 162(a). There are 156 mandatory Class I areas. The list of areas to which the requirements of the visibility protection program apply is in 40 CFR part 81, subpart D.

[4] In addition to the generally applicable regional haze provisions at 40 CFR 51.308, the EPA also promulgated regulations specific to addressing regional haze visibility impairment in Class I areas on the Colorado Plateau at 40 CFR 51.309. The latter regulations are applicable only for specific jurisdictions' regional haze plans submitted no later than December 17, 2007, and thus are not relevant here.

[5] There are several ways to measure the amount of visibility impairment, *i.e.,* haze. One such measurement is the deciview, which is the principal metric used by the RHR. Under many circumstances, a change in one deciview will be perceived by the human eye to be the same on both clear and hazy days. The deciview is unitless. It is proportional to the logarithm of the atmospheric extinction of light, which is the perceived dimming of light due to its being scattered and absorbed as it passes through the atmosphere. Atmospheric light extinction (b^{ext}) is a metric used for expressing visibility and is measured in inverse megameters (Mm^{-1}). The EPA's Guidance on Regional Haze State Implementation Plans for the Second Implementation Period (''2019 Guidance'') offers the flexibility for the use of light extinction in certain cases. Light extinction can be simpler to use in calculations than deciviews, since it is not a logarithmic function. See, *e.g.,* 2019 Guidance at 16, 19, *https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period,* The EPA Office of Air Quality Planning and Standards, Research Triangle Park (August 20, 2019). The formula for the deciview is $10 \ln (b^{ext}/10\ Mm - 1)$. 40 CFR 51.301.

[6] The RHR expresses the statutory requirement for states to submit plans addressing out-of-state Class I areas by providing that states must address visibility impairment ''in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State.'' 40 CFR 51.308(d), (f).

[7] In addition to each of the fifty states, the EPA also concluded that the Virgin Islands and District of Columbia must also submit regional haze SIPs because they either contain a Class I area or contain sources whose emissions are reasonably anticipated to contribute regional haze in a Class I area. *See* 40 CFR 51.300(b), (d)(3).

impairment) for each Class I area, and to calculate the linear rate of progress needed to attain natural visibility conditions, assuming a starting point of baseline visibility conditions in 2004 and ending with natural conditions in 2064. This linear interpolation is known as the uniform rate of progress (URP) and is used as a tracking metric to help states assess the amount of progress they are making towards the national visibility goal over time in each Class I area.[8] 40 CFR 51.308(d)(1)(i)(B), (d)(2). The 1999 RHR also provided that States' long-term strategies must include the ''enforceable emissions limitations, compliance, schedules, and other measures as necessary to achieve the reasonable progress goals.'' 40 CFR 51.308(d)(3). In establishing their long-term strategies, states are required to consult with other states that also contribute to visibility impairment in a given Class I area and include all measures necessary to obtain their shares of the emission reductions needed to meet the RPGs. 40 CFR 51.308(d)(3)(i), (ii). Section 51.308(d) also contains seven additional factors states must consider in formulating their long-term strategies, 40 CFR 51.308(d)(3)(v), as well as provisions governing monitoring and other implementation plan requirements. 40 CFR 51.308(d)(4). Finally, the 1999 RHR required states to submit periodic progress reports—SIP revisions due every five years that contain information on states' implementation of their regional haze plans and an assessment of whether anything additional is needed to make reasonable progress, see 40 CFR 51.308(g), (h)—and to consult with the Federal Land Manager(s)[9] (FLMs) responsible for each Class I area according to the requirements in CAA 169A(d) and 40 CFR 51.308(i).

On January 10, 2017, the EPA promulgated revisions to the RHR, (82 FR 3078, January 10, 2017), that apply for the second and subsequent implementation periods. The 2017 rulemaking made several changes to the requirements for regional haze SIPs to clarify States' obligations and streamline certain regional haze requirements. The revisions to the regional haze program for the second and subsequent implementation periods focused on the requirement that States' SIPs contain long-term strategies for making reasonable progress towards the national visibility goal. The reasonable progress requirements as revised in the 2017 rulemaking (referred to here as the 2017 RHR Revisions) are codified at 40 CFR 51.308(f). Among other changes, the 2017 RHR Revisions adjusted the deadline for States to submit their second implementation period SIPs from July 31, 2018, to July 31, 2021, clarified the order of analysis and the relationship between RPGs and the long-term strategy, and focused on making visibility improvements on the days with the most *anthropogenic* visibility impairment, as opposed to the days with the most visibility impairment overall. The EPA also revised requirements of the visibility protection program related to periodic progress reports and FLM consultation. The specific requirements applicable to second implementation period regional haze SIP submissions are addressed in detail below.

The EPA provided guidance to the states for their second implementation period SIP submissions in the preamble to the 2017 RHR Revisions as well as in subsequent, stand-alone guidance documents. In August 2019, the EPA issued ''Guidance on Regional Haze State Implementation Plans for the Second Implementation Period'' (''2019 Guidance'').[10] On July 8, 2021, the EPA issued a memorandum containing ''Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period'' (''2021 Clarifications Memo'').[11] Additionally, the EPA further clarified the recommended procedures for processing ambient visibility data and optionally adjusting the URP to account for international anthropogenic and prescribed fire impacts in two technical guidance documents: the December 2018 ''Technical Guidance on Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program'' (''2018 Visibility Tracking Guidance''),[12] and the June 2020 ''Recommendation for the Use of Patched and Substituted Data and Clarification of Data Completeness for Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program'' and associated Technical Addendum (''2020 Data Completeness Memo'').[13]

As explained in the 2021 Clarifications Memo, the EPA intends the second implementation period of the regional haze program to secure meaningful reductions in visibility impairing pollutants that build on the significant progress states have achieved to date. The Agency also recognizes that analyses regarding reasonable progress are State-specific and that, based on states' and sources' individual circumstances, what constitutes reasonable reductions in visibility impairing pollutants will vary from State-to-State. While there exist many opportunities for states to leverage both ongoing and upcoming emission reductions under other CAA programs, the Agency expects states to undertake rigorous reasonable progress analyses that identify further opportunities to advance the national visibility goal consistent with the statutory and regulatory requirements. See generally 2021 Clarifications Memo. This is consistent with Congress's determination that a visibility protection program is needed in addition to the CAA's National Ambient Air Quality Standards and Prevention of Significant Deterioration programs, as

[8] The EPA established the URP framework in the 1999 RHR to provide ''an equitable analytical approach'' to assessing the rate of visibility improvement at Class I areas across the country. The starting point for the URP analysis is 2004 and the endpoint was calculated based on the amount of visibility improvement that was anticipated to result from implementation of existing CAA programs over the period from the mid-1990s to approximately 2005. Assuming this rate of progress would continue into the future, the EPA determined that natural visibility conditions would be reached in 60 years, or 2064 (60 years from the baseline starting point of 2004). However, the EPA did not establish 2064 as the year by which the national goal *must* be reached. 64 FR at 35731–32. That is, the URP and the 2064 date are not enforceable targets but are rather tools that ''allow for analytical comparisons between the rate of progress that would be achieved by the state's chosen set of control measures and the URP.'' (82 FR 3078, 3084, January 10, 2017).

[9] The EPA's regulations define ''Federal Land Manager'' as ''the Secretary of the department with authority over the Federal Class I area (or the Secretary's designee) or, with respect to Roosevelt-Campobello International Park, the Chairman of the Roosevelt-Campobello International Park Commission.'' 40 CFR 51.301.

[10] Guidance on Regional Haze State Implementation Plans for the Second Implementation Period. *https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period* The EPA Office of Air Quality Planning and Standards, Research Triangle Park (August 20, 2019).

[11] Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period. *https://www.epa.gov/system/files/documents/2021-07/clarifications-regarding-regional-haze-state-implementation-plans-for-the-second-implementation-period.pdf.* The EPA Office of Air Quality Planning and Standards, Research Triangle Park (July 8, 2021).

[12] Technical Guidance on Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program. *https://www.epa.gov/visibility/technical-guidance-tracking-visibility-progress-second-implementation-period-regional* The EPA Office of Air Quality Planning and Standards, Research Triangle Park. (December 20, 2018).

[13] Recommendation for the Use of Patched and Substituted Data and Clarification of Data Completeness for Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program. *https://www.epa.gov/visibility/memo-and-technical-addendum-ambient-data-usage-and-completeness-regional-haze-program* The EPA Office of Air Quality Planning and Standards, Research Triangle Park (June 3, 2020).

further emission reductions may be necessary to adequately protect visibility in Class I areas throughout the country.[14]

B. Roles of Agencies in Addressing Regional Haze

Because the air pollutants and pollution affecting visibility in Class I areas can be transported over long distances, successful implementation of the regional haze program requires long-term, regional coordination among multiple jurisdictions and agencies that have responsibility for Class I areas and the emissions that impact visibility in those areas. To address regional haze, states need to develop strategies in coordination with one another, considering the effect of emissions from one jurisdiction on the air quality in another. Five regional planning organizations (RPOs),[15] which include representation from State and Tribal governments, the EPA, and FLMs, were developed in the lead-up to the first implementation period to address regional haze. RPOs evaluate technical information to better understand how emissions from State and Tribal land impact Class I areas across the country, pursue the development of regional strategies to reduce emissions of particulate matter and other pollutants leading to regional haze, and help states meet the consultation requirements of the RHR.

The Central Regional Air Planning Association (CenRAP), one of the five RPOs described above, that Texas was a member of during the first planning period, was a collaborative effort of State governments, Tribal governments, and Federal agencies established to initiate and coordinate activities associated with the management of regional haze, visibility, and other air quality issues in parts of the Great Plains, Midwest, Southwest, and South Regions of the United States.

After the first planning period SIPs were submitted, the planning was shifted to the Central State Air Resources Agencies (CenSARA). CenSARA was established to promote the exchange of air quality information, knowledge, experience, and data among and between participating organizations and other interested parties. It supports the membership with training and policy and technical projects. CenSARA supports and promotes collaborative efforts of State governments to initiate and coordinate activities associated with the management of regional haze and other air quality issues in parts of the Great Plains, Midwest, Southwest, and South Regions of the United States. Member states include: Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, Oklahoma, and Texas. Unlike CenRAP, CenSARA has solely State and local government members. However, CenSARA does reach out to Tribal and Federal partners. The Federal partners of CenSARA are the EPA, the NPS, the FWS, and FS.

III. Requirements for Regional Haze Plans for the Second Implementation Period

Under the CAA and EPA's regulations, all 50 States, the District of Columbia, and the U.S. Virgin Islands are required to submit regional haze SIPs satisfying the applicable requirements for the second implementation period of the regional haze program by July 31, 2021. Each state's SIP must contain a long-term strategy for making reasonable progress toward meeting the national goal of remedying any existing and preventing any future anthropogenic visibility impairment in Class I areas. CAA 169A(b)(2)(B). To this end, § 51.308(f) lays out the process by which states determine what constitutes their long-term strategies, with the order of the requirements in § 51.308(f)(1) through (f)(3) generally mirroring the order of the steps in the reasonable progress analysis[16] and (f)(4) through (f)(6) containing additional, related requirements. Broadly speaking, a State first must identify the Class I areas within the State and determine the Class I areas outside the State in which visibility may be affected by emissions from the State. These are the Class I areas that must be addressed in the state's long-term strategy. See 40 CFR 51.308(f), (f)(2). For each Class I area within its borders, a State must then calculate the baseline, current, and natural visibility conditions for that area, as well as the visibility improvement made to date and the URP. See 40 CFR 51.308(f)(1). Each State having a Class I area and/or emissions that may affect visibility in a Class I area must then develop a long-term strategy that includes the enforceable emission limitations, compliance schedules, and other measures that are necessary to make reasonable progress in such areas. A reasonable progress determination is based on applying the four factors in CAA section 169A(g)(1) to sources of visibility impairing pollutants that the State has selected to assess for controls for the second implementation period. Additionally, as further explained below, the RHR at 40 CFR 51.3108(f)(2)(iv) separately provides five ''additional factors'' [17] that states must consider in developing their long-term strategies. See 40 CFR 51.308(f)(2). A State evaluates potential emission reduction measures for those selected sources and determines which are necessary to make reasonable progress. Those measures are then incorporated into the state's long-term strategy. After a State has developed its long-term strategy, it then establishes RPGs for each Class I area within its borders by modeling the visibility impacts of all reasonable progress controls at the end of the second implementation period, *i.e.,* in 2028, as well as the impacts of other requirements of the CAA. The RPGs include reasonable progress controls not only for sources in the State in which the Class I area is located, but also for sources in other states that contribute to visibility impairment in that area. The RPGs are then compared to the baseline visibility conditions and the URP to ensure that progress is being made towards the statutory goal of preventing any future and remedying any existing anthropogenic visibility impairment in Class I areas. 40 CFR 51.308(f)(2)–(3).

In addition to satisfying the requirements at 40 CFR 51.308(f) related to reasonable progress, the regional haze SIP revisions for the second implementation period must address the requirements in § 51.308(g)(1) through (5) pertaining to periodic reports describing progress towards the RPGs, 40 CFR 51.308(f)(5), as well as requirements for FLM consultation that apply to all visibility protection SIPs and SIP revisions. 40 CFR 51.308(i).

A State must submit its regional haze SIP and subsequent SIP revisions to the EPA according to the requirements applicable to all SIP revisions under the CAA and EPA's regulations. See CAA 169A(b)(2); CAA 110(a). Upon EPA approval, a SIP is enforceable by the Agency and the public under the CAA.

[14] See, *e.g.,* H.R. Rep No. 95–294 at 205 (''In determining how to best remedy the growing visibility problem in these areas of great scenic importance, the committee realizes that as a matter of equity, the national ambient air quality standards cannot be revised to adequately protect visibility in all areas of the country.''), (''the mandatory class I increments of [the PSD program] do not adequately protect visibility in class I areas'').

[15] RPOs are sometimes also referred to as ''multi-jurisdictional organizations,'' or MJOs. For the purposes of this notice, the terms RPO and MJO are synonymous.

[16] The EPA explained in the 2017 RHR Revisions that we were adopting new regulatory language in 40 CFR 51.308(f) that, unlike the structure in 51.308(d), ''tracked the actual planning sequence.'' (82 FR 3091, January 10, 2017).

[17] The five ''additional factors'' for consideration in section 51.308(f)(2)(iv) are distinct from the four factors listed in CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i) that states must consider and apply to sources in determining reasonable progress.

If EPA finds that a State fails to make a required SIP revision, or if the EPA finds that a state's SIP is incomplete or disapproves the SIP, the Agency must promulgate a federal implementation plan (FIP) that satisfies the applicable requirements. CAA 110(c)(1).

A. Identification of Class I Areas

The first step in developing a regional haze SIP is for a State to determine which Class I areas, in addition to those within its borders, ''may be affected'' by emissions from within the State. In the 1999 RHR, the EPA determined that all states contribute to visibility impairment in at least one Class I area, 64 FR at 35720–22, and explained that the statute and regulations lay out an ''extremely low triggering threshold'' for determining ''whether States should be required to engage in air quality planning and analysis as a prerequisite to determining the need for control of emissions from sources within their State.'' *Id.* at 35721.

A State must determine which Class I areas must be addressed by its SIP by evaluating the total emissions of visibility impairing pollutants from all sources within the State. While the RHR does not require this evaluation to be conducted in any particular manner, EPA's 2019 Guidance provides recommendations for how such an assessment might be accomplished, including by, where appropriate, using the determinations previously made for the first implementation period. 2019 Guidance at 8–9. In addition, the determination of which Class I areas may be affected by a state's emissions is subject to the requirement in 40 CFR 51.308(f)(2)(iii) to ''document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I Federal area it affects.''

B. Calculations of Baseline, Current, and Natural Visibility Conditions; Progress to Date; and the Uniform Rate of Progress

As part of assessing whether a SIP submission for the second implementation period is providing for reasonable progress towards the national visibility goal, the RHR contains requirements in § 51.308(f)(1) related to tracking visibility improvement over time. The requirements of this subsection apply only to states having Class I areas within their borders; the required calculations must be made for each such Class I area. EPA's 2018 Visibility Tracking Guidance [18] provides recommendations to assist states in satisfying their obligations under § 51.308(f)(1); specifically, in developing information on baseline, current, and natural visibility conditions, and in making optional adjustments to the URP to account for the impacts of international anthropogenic emissions and prescribed fires. See 82 FR at 3103–05.

The RHR requires tracking of visibility conditions on two sets of days: the clearest and the most impaired days. Visibility conditions for both sets of days are expressed as the average deciview index for the relevant five-year period (the period representing baseline or current visibility conditions). The RHR provides that the relevant sets of days for visibility tracking purposes are the 20% clearest (the 20% of monitored days in a calendar year with the lowest values of the deciview index) and 20% most impaired days (the 20% of monitored days in a calendar year with the highest amounts of anthropogenic visibility impairment).[19] 40 CFR 51.301. A State must calculate visibility conditions for both the 20% clearest and 20% most impaired days for the baseline period of 2000–2004 and the most recent five-year period for which visibility monitoring data are available (representing current visibility conditions). 40 CFR 51.308(f)(1)(i), (iii). States must also calculate natural visibility conditions for the clearest and most impaired days,[20] by estimating the conditions that would exist on those two sets of days absent anthropogenic visibility impairment. 40 CFR 51.308(f)(1)(ii). Using all these data, states must then calculate, for each Class I area, the amount of progress made since the baseline period (2000–2004) and how much improvement is left to achieve to reach natural visibility conditions.

Using the data for the set of most impaired days only, states must plot a line between visibility conditions in the baseline period and natural visibility conditions for each Class I area to determine the URP—the amount of visibility improvement, measured in deciviews, that would need to be achieved during each implementation period to achieve natural visibility conditions by the end of 2064. The URP is used in later steps of the reasonable progress analysis for informational purposes and to provide a non-enforceable benchmark against which to assess a Class I area's rate of visibility improvement.[21] Additionally, in the 2017 RHR Revisions, the EPA provided states the option of proposing to adjust the endpoint of the URP to account for impacts of anthropogenic sources outside the United States and/or impacts of certain types of wildland prescribed fires. These adjustments, which must be approved by the EPA, are intended to avoid any perception that states should compensate for impacts from international anthropogenic sources and to give states the flexibility to determine that limiting the use of wildland-prescribed fire is not necessary for reasonable progress. 82 FR 3107 footnote 116.

The EPA's 2018 Visibility Tracking Guidance can be used to help satisfy the 40 CFR 51.308(f)(1) requirements, including in developing information on baseline, current, and natural visibility conditions, and in making optional adjustments to the URP. In addition, the 2020 Data Completeness Memo provides recommendations on the data completeness language referenced in § 51.308(f)(1)(i) and provides updated natural conditions estimates for each Class I area.

C. Long-Term Strategy for Regional Haze

The core component of a regional haze SIP submission is a long-term strategy that addresses regional haze in each Class I area within a state's borders and each Class I area that may be affected by emissions from the State. The long-term strategy ''must include the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress, as determined pursuant to (f)(2)(i) through (iv).'' 40

[18] The 2018 Visibility Tracking Guidance references and relies on parts of the 2003 Tracking Guidance: ''Guidance for Tracking Progress Under the Regional Haze Rule,'' which can be found at *https://www3.epa.gov/ttnamti1/files/ambient/visible/tracking.pdf.*

[19] This notice also refers to the 20% clearest and 20% most anthropogenically impaired days as the ''clearest'' and ''most impaired'' or ''most anthropogenically impaired'' days, respectively.

[20] The RHR at 40 CFR 51.308(f)(1)(ii) contains an error related to the requirement for calculating two sets of natural conditions values. The rule says ''most impaired days or the clearest days'' where it should say ''most impaired days and clearest days.'' This is an error that was intended to be corrected in the 2017 RHR Revisions but did not get corrected in the final rule language. This is supported by the preamble text at 82 FR 3098: ''In the final version of 40 CFR 51.308(f)(1)(ii), an occurrence of ''or'' has been corrected to ''and'' to indicate that natural visibility conditions for both the most impaired days and the clearest days must be based on available monitoring information.''

[21] Being on or below the URP is not a ''safe harbor''; *i.e.,* achieving the URP does not mean that a Class I area is making ''reasonable progress'' and does not relieve a state from using the four statutory factors to determine what level of control is needed to achieve such progress. *See, e.g.,* 82 FR at 3093.

CFR 51.308(f)(2). The amount of progress that is ''reasonable progress'' is based on applying the four statutory factors in CAA section 169A(g)(1) in an evaluation of potential control options for sources of visibility impairing pollutants, which is referred to as a ''four-factor'' analysis. The outcome of that analysis is the emission reduction measures that a particular source or group of sources needs to implement to make reasonable progress towards the national visibility goal. See 40 CFR 51.308(f)(2)(i). Emission reduction measures that are necessary to make reasonable progress may be either new, additional control measures for a source, or they may be the existing emission reduction measures that a source is already implementing. See 2019 Guidance at 43; 2021 Clarifications Memo at 8–10. Such measures must be represented by ''enforceable emissions limitations, compliance schedules, and other measures'' (*i.e.,* any additional compliance tools) in a state's long-term strategy in its SIP. 40 CFR 51.308(f)(2).

Section 51.308(f)(2)(i) provides the requirements for the four-factor analysis. The first step of this analysis entails selecting the sources to be evaluated for emission reduction measures; to this end, the RHR requires states to consider ''major and minor stationary sources or groups of sources, mobile sources, and area sources'' of visibility impairing pollutants for potential four-factor control analysis. 40 CFR 51.308(f)(2)(i). A threshold question at this step is which visibility impairing pollutants will be analyzed. As EPA previously explained, consistent with the first implementation period, EPA generally expects that each State will analyze at least SO_2 and NO_X in selecting sources and determining control measures. See 2019 Guidance at 12; 2021 Clarifications Memo at 4. A State that chooses not to consider at least these two pollutants should demonstrate why such consideration would be unreasonable. 2021 Clarifications Memo at 4.

While states have the option to analyze *all* sources, the 2019 Guidance explains that ''an analysis of control measures is not required for every source in each implementation period,'' and that ''[s]electing a set of sources for analysis of control measures in each implementation period is . . . consistent with the Regional Haze Rule, which sets up an iterative planning process and anticipates that a State may not need to analyze control measures for all its sources in a given SIP revision.'' 2019 Guidance at 9. However, given that source selection is the basis of all subsequent control determinations, a reasonable source selection process ''should be designed and conducted to ensure that source selection results in a set of pollutants and sources the evaluation of which has the potential to meaningfully reduce their contributions to visibility impairment.'' 2021 Clarifications Memo at 3.

EPA explained in the 2021 Clarifications Memo that each State has an obligation to submit a long-term strategy that addresses the regional haze visibility impairment that results from emissions from within that State. Thus, source selection should focus on the in-state contribution to visibility impairment and be designed to capture a meaningful portion of the state's total contribution to visibility impairment in Class I areas. A State should not decline to select its largest in-state sources on the basis that there are even larger out-of-state contributors. 2021 Clarifications Memo at 4.[22]

Thus, while states have discretion to choose any source selection methodology that is reasonable, whatever choices they make should be reasonably explained. To this end, 40 CFR 51.308(f)(2)(i) requires that a state's SIP submission include ''a description of the criteria it used to determine which sources or groups of sources it evaluated.'' The technical basis for source selection, which may include methods for quantifying potential visibility impacts such as emissions divided by distance metrics, trajectory analyses, residence time analyses, and/or photochemical modeling, must also be appropriately documented, as required by 40 CFR 51.308(f)(2)(iii).

Once a State has selected the set of sources, the next step is to determine the emissions reduction measures for those sources that are necessary to make reasonable progress for the second implementation period.[23] This is accomplished by considering the four factors—''the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements.'' CAA 169A(g)(1). The EPA has explained that the four-factor analysis is an assessment of potential emission reduction measures (*i.e.,* control options) for sources; ''use of the terms 'compliance' and 'subject to such requirements' in section 169A(g)(1) strongly indicates that Congress intended the relevant determination to be the requirements with which sources would have to comply to satisfy the CAA's reasonable progress mandate.'' 82 FR at 3091. Thus, for each source it has selected for four-factor analysis,[24] a State must consider a ''meaningful set'' of technically feasible control options for reducing emissions of visibility impairing pollutants. *Id.* at 3088. The 2019 Guidance provides that ''[a] State must reasonably pick and justify the measures that it will consider, recognizing that there is no statutory or regulatory requirement to consider all technically feasible measures or any particular measures. A range of technically feasible measures available to reduce emissions would be one way to justify a reasonable set.'' 2019 Guidance at 29.

EPA's 2021 Clarifications Memo provides further guidance on what constitutes a reasonable set of control options for consideration: ''A reasonable four-factor analysis will consider the full range of potentially reasonable options for reducing emissions.'' 2021 Clarifications Memo at 7. In addition to add-on controls and other retrofits (*i.e.,* new emissions reduction measures for sources), EPA explained that states should generally analyze efficiency improvements for sources' existing measures as control options in their four-factor analyses, as in many cases such improvements are reasonable given that they typically involve only additional operation and maintenance

[22] Similarly, in responding to comments on the 2017 RHR Revisions the EPA explained that ''[a] state should not fail to address its many relatively low-impact sources merely because it only has such sources and another state has even more low-impact sources and/or some high impact sources.'' Responses to Comments on Protection of Visibility: Amendments to Requirements for State Plans; Proposed Rule (81 FR 26942, May 4, 2016) at 87–88.

[23] The CAA provides that, ''[i]n determining reasonable progress there shall be taken into consideration'' the four statutory factors. CAA 169A(g)(1). However, in addition to four-factor analyses for selected sources, groups of sources, or source categories, a state may also consider additional emission reduction measures for inclusion in its long-term strategy, *e.g.,* from other newly adopted, on-the-books, or on-the-way rules and measures for sources not selected for four-factor analysis for the second planning period.

[24] ''Each source'' or ''particular source'' is used here as shorthand. While a source-specific analysis is one way of applying the four factors, neither the statute nor the RHR requires states to evaluate individual sources. Rather, states have ''the flexibility to conduct four-factor analyses for specific sources, groups of sources or even entire source categories, depending on state policy preferences and the specific circumstances of each state.'' 82 FR at 3088. However, not all approaches to grouping sources for four-factor analysis are necessarily reasonable; the reasonableness of grouping sources in any particular instance will depend on the circumstances and the manner in which grouping is conducted. If it is feasible to establish and enforce different requirements for sources or subgroups of sources, and if relevant factors can be quantified for those sources or subgroups, then states should make a separate reasonable progress determination for each source or subgroup. 2021 Clarifications Memo at 7–8.

costs. Additionally, the 2021 Clarifications Memo provides that states that have assumed a higher emissions rate than a source has achieved or could potentially achieve using its existing measures should also consider lower emissions rates as potential control options. That is, a State should consider a source's recent actual and projected emission rates to determine if it could reasonably attain lower emission rates with its existing measures. If so, the State should analyze the lower emission rate as a control option for reducing emissions. 2021 Clarifications Memo at 7. The EPA's recommendations to analyze potential efficiency improvements and achievable lower emission rates apply to both sources that have been selected for four-factor analysis and those that have forgone a four-factor analysis on the basis of existing ''effective controls.'' See 2021 Clarifications Memo at 5, 10.

After identifying a reasonable set of potential control options for the sources it has selected, a State then collects information on the four factors with regard to each option identified. The EPA has also explained that, in addition to the four statutory factors, states have flexibility under the CAA and RHR to reasonably consider visibility benefits as an additional factor alongside the four statutory factors.[25] The 2019 Guidance provides recommendations for the types of information that can be used to characterize the four factors (with or without visibility), as well as ways in which states might reasonably consider and balance that information to determine which of the potential control options is necessary to make reasonable progress. See 2019 Guidance at 30–36. The 2021 Clarifications Memo contains further guidance on how states can reasonably consider modeled visibility impacts or benefits in the context of a four-factor analysis. 2021 Clarifications Memo at 12–13, 14–15. Specifically, the EPA explained that while visibility can reasonably be used when comparing and choosing between multiple reasonable control options, it should not be used to summarily reject controls that are reasonable given the four statutory factors. 2021 Clarifications Memo at 13. Ultimately, while states have discretion to reasonably weigh the factors and to determine what level of control is needed, § 51.308(f)(2)(i) provides that a State ''must include in its implementation plan a description of . . . how the four factors were taken into consideration in selecting the measure for inclusion in its long-term strategy.''

As explained above, § 51.308(f)(2)(i) requires states to determine the emission reduction measures for sources that are necessary to make reasonable progress by considering the four factors. Pursuant to § 51.308(f)(2), measures that are necessary to make reasonable progress towards the national visibility goal must be included in a state's long-term strategy and in its SIP.[26] If the outcome of a four-factor analysis is a new, additional emission reduction measure for a source, that new measure is necessary to make reasonable progress towards remedying existing anthropogenic visibility impairment and must be included in the SIP. If the outcome of a four-factor analysis is that no new measures are reasonable for a source, continued implementation of the source's existing measures is generally necessary to prevent future emission increases and thus to make reasonable progress towards the second part of the national visibility goal: preventing future anthropogenic visibility impairment. See CAA 169A(a)(1). That is, when the result of a four-factor analysis is that no new measures are necessary to make reasonable progress, the source's existing measures are generally necessary to make reasonable progress and must be included in the SIP. However, there may be circumstances in which a State can demonstrate that a source's existing measures are *not* necessary to make reasonable progress. Specifically, if a State can demonstrate that a source will continue to implement its existing measures and will not increase its emissions rate, it may not be necessary to have those measures in the long-term strategy to prevent future emissions increases and future visibility impairment. The EPA's 2021 Clarifications Memo provides further explanation and guidance on how states may demonstrate that a source's existing measures are not necessary to make reasonable progress. See 2021 Clarifications Memo at 8–10. If the State can make such a demonstration, it need not include a source's existing measures in the long-term strategy or its SIP.

As with source selection, the characterization of information on each of the factors is also subject to the documentation requirement in § 51.308(f)(2)(iii). The reasonable progress analysis, including source selection, information gathering, characterization of the four statutory factors (and potentially visibility), balancing of the four factors, and selection of the emission reduction measures that represent reasonable progress, is a technically complex exercise, but also a flexible one that provides states with bounded discretion to design and implement approaches appropriate to their circumstances. Given this flexibility, § 51.308(f)(2)(iii) plays an important function in requiring a State to document the technical basis for its decision making so that the public and the EPA can comprehend and evaluate the information and analysis the State relied upon to determine what emission reduction measures must be in place to make reasonable progress. The technical documentation must include the modeling, monitoring, cost, engineering, and emissions information on which the State relied to determine the measures necessary to make reasonable progress. This documentation requirement can be met through the provision of and reliance on technical analyses developed through a regional planning process, so long as that process and its output has been approved by all State participants. In addition to the explicit regulatory requirement to document the technical basis of their reasonable progress determinations, states are also subject to the general principle that those determinations must be reasonably moored to the statute.[27] That is, a state's decisions about the emission reduction measures that are necessary to make reasonable progress must be consistent with the statutory goal of remedying existing and preventing future visibility impairment.

The four statutory factors (and potentially visibility) are used to determine what emission reduction measures for selected sources must be included in a state's long-term strategy

[25] See, *e.g.,* Responses to Comments on Protection of Visibility: Amendments to Requirements for State Plans; Proposed Rule (81 FR 26942, May 4, 2016) (December 2016), Docket Number EPA–HQ–OAR–2015–0531, U.S. Environmental Protection Agency at 186; 2019 Guidance at 36–37.

[26] States may choose to, but are not required to, include measures in their long-term strategies beyond just the emission reduction measures that are necessary for reasonable progress. See 2021 Clarifications Memo at 16. For example, states with smoke management programs may choose to submit their smoke management plans to the EPA for inclusion in their SIPs but are not required to do so. See, *e.g.,* 82 FR at 3108–09 (requirement to consider smoke management practices and smoke management programs under 40 CFR 51.308(f)(2)(iv) does not require states to adopt such practices or programs into their SIPs, although they may elect to do so).

[27] See *Arizona ex rel. Darwin* v. *U.S. EPA*, 815 F.3d 519, 531 (9th Cir. 2016); *Nebraska* v. *U.S. EPA*, 812 F.3d 662, 668 (8th Cir. 2016); *North Dakota* v. *EPA*, 730 F.3d 750, 761 (8th Cir. 2013); *Oklahoma* v. *EPA*, 723 F.3d 1201, 1206, 1208–10 (10th Cir. 2013); cf. also *Nat'l Parks Conservation Ass'n* v. *EPA*, 803 F.3d 151, 165 (3d Cir. 2015); *Alaska Dep't of Envtl. Conservation* v. *EPA,* 540 U.S. 461, 485, 490 (2004).

for making reasonable progress. Additionally, the RHR at 40 CFR 51.3108(f)(2)(iv) separately provides five ''additional factors'' [28] that states must consider in developing their long-term strategies: (1) Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment; (2) measures to reduce the impacts of construction activities; (3) source retirement and replacement schedules; (4) basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs; and (5) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. The 2019 Guidance provides that a State may satisfy this requirement by considering these additional factors in the process of selecting sources for four-factor analysis, when performing that analysis, or both, and that not every one of the additional factors needs to be considered at the same stage of the process. See 2019 Guidance at 21. The EPA provided further guidance on the five additional factors in the 2021 Clarifications Memo, explaining that a State should generally not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas. Additionally, states generally should not rely on these additional factors to summarily assert that the State has already made sufficient progress and, therefore, no sources need to be selected or no new controls are needed regardless of the outcome of four-factor analyses. 2021 Clarifications Memo at 13.

Because the air pollution that causes regional haze crosses State boundaries, § 51.308(f)(2)(ii) requires a State to consult with other states that also have emissions that are reasonably anticipated to contribute to visibility impairment in a given Class I area. Consultation allows for each State that impacts visibility in an area to share whatever technical information, analyses, and control determinations may be necessary to develop coordinated emission management strategies. This coordination may be managed through inter- and intra-RPO consultation and the development of regional emissions strategies; additional consultations between states outside of RPO processes may also occur. If a State, pursuant to consultation, agrees that certain measures (*e.g.,* a certain emission limitation) are necessary to make reasonable progress at a Class I area, it must include those measures in its SIP. 40 CFR 51.308(f)(2)(ii)(A). Additionally, the RHR requires that states that contribute to visibility impairment at the same Class I area consider the emission reduction measures the other contributing states have identified as being necessary to make reasonable progress for their own sources. 40 CFR 51.308(f)(2)(ii)(B). If a State has been asked to consider or adopt certain emission reduction measures, but ultimately determines those measures are not necessary to make reasonable progress, that State must document in its SIP the actions taken to resolve the disagreement. 40 CFR 51.308(f)(2)(ii)(C). The EPA will consider the technical information and explanations presented by the submitting State and the State with which it disagrees when considering whether to approve the state's SIP. See *Id.;* 2019 Guidance at 53. Under all circumstances, a State must document in its SIP submission all substantive consultations with other contributing states. 40 CFR 51.308(f)(2)(ii)(C).

D. Reasonable Progress Goals

Reasonable progress goals ''measure the progress that is projected to be achieved by the control measures states have determined are necessary to make reasonable progress based on a four-factor analysis.'' 82 FR at 3091. Their primary purpose is to assist the public and the EPA in assessing the reasonableness of states' long-term strategies for making reasonable progress towards the national visibility goal. See 40 CFR 51.308(f)(3)(iii)–(iv). States in which Class I areas are located must establish two RPGs, both in deciviews—one representing visibility conditions on the clearest days and one representing visibility on the most anthropogenically impaired days—for each area within their borders. 40 CFR 51.308(f)(3)(i). The two RPGs are intended to reflect the projected impacts, on the two sets of days, of the emission reduction measures the State with the Class I area, as well as all other contributing states, have included in their long-term strategies for the second implementation period.[29] The RPGs also account for the projected impacts of implementing other CAA requirements, including non-SIP based requirements. Because RPGs are the modeled result of the measures in states' long-term strategies (as well as other measures required under the CAA), they cannot be determined before states have conducted their four-factor analyses and determined the control measures that are necessary to make reasonable progress. See 2021 Clarifications Memo at 6.

For the second implementation period, the RPGs are set for 2028. Reasonable progress goals are not enforceable targets, 40 CFR 51.308(f)(3)(iii); rather, they ''provide a way for the states to check the projected outcome of the [long-term strategy] against the goals for visibility improvement.'' 2019 Guidance at 46. While states are not legally obligated to achieve the visibility conditions described in their RPGs, § 51.308(f)(3)(i) requires that ''[t]he long-term strategy and the reasonable progress goals must provide for an improvement in visibility for the most impaired days since the baseline period and ensure no degradation in visibility for the clearest days since the baseline period.'' Thus, states are required to have emission reduction measures in their long-term strategies that are projected to achieve visibility conditions on the most impaired days that are better than the baseline period and shows no degradation on the clearest days compared to the clearest days from the baseline period. The baseline period for the purpose of this comparison is the baseline visibility condition—the annual average visibility condition for the period 2000–2004. See 40 CFR 51.308(f)(1)(i), 82 FR at 3097–98.

So that RPGs may also serve as a metric for assessing the amount of progress a State is making towards the national visibility goal, the RHR requires states with Class I areas to compare the 2028 RPG for the most impaired days to the corresponding point on the URP line (representing visibility conditions in 2028 if visibility

[28] The five ''additional factors'' for consideration in section 51.308(f)(2)(iv) are distinct from the four factors listed in CAA section 169A(g)(1) and 40 CFR 51.308(f)(2)(i) that states must consider and apply to sources in determining reasonable progress.

[29] RPGs are intended to reflect the projected impacts of the measures all contributing states include in their long-term strategies. However, due to the timing of analyses and of control determinations by other states, other on-going emissions changes, a particular state's RPGs may not reflect all control measures and emissions reductions that are expected to occur by the end of the implementation period. The 2019 Guidance provides recommendations for addressing the timing of RPG calculations when states are developing their long-term strategies on disparate schedules, as well as for adjusting RPGs using a post-modeling approach. 2019 Guidance at 47–48.

were to improve at a linear rate from conditions in the baseline period of 2000–2004 to natural visibility conditions in 2064). If the most impaired days RPG in 2028 is above the URP (*i.e.,* if visibility conditions are improving more slowly than the rate described by the URP), each State that contributes to visibility impairment in the Class I area must demonstrate, based on the four-factor analysis required under 40 CFR 51.308(f)(2)(i), that no additional emission reduction measures would be reasonable to include in its long-term strategy. 40 CFR 51.308(f)(3)(ii). To this end, 40 CFR 51.308(f)(3)(ii) requires that each State contributing to visibility impairment in a Class I area that is projected to improve more slowly than the URP provide ''a robust demonstration, including documenting the criteria used to determine which sources or groups [of] sources were evaluated and how the four factors required by paragraph (f)(2)(i) were taken into consideration in selecting the measures for inclusion in its long-term strategy.'' The 2019 Guidance provides suggestions about how such a ''robust demonstration'' might be conducted. See 2019 Guidance at 50–51.

The 2017 RHR, 2019 Guidance, and 2021 Clarifications Memo also explain that projecting an RPG that is on or below the URP based on only on-the-books and/or on-the-way control measures (*i.e.,* control measures already required or anticipated before the four-factor analysis is conducted) is not a ''safe harbor'' from the CAA's and RHR's requirement that all states must conduct a four-factor analysis to determine what emission reduction measures constitute reasonable progress. The URP is a planning metric used to gauge the amount of progress made thus far and the amount left before reaching natural visibility conditions. However, the URP is not based on consideration of the four statutory factors and therefore cannot answer the question of whether the amount of progress being made in any particular implementation period is ''reasonable progress.'' See 82 FR at 3093, 3099–3100; 2019 Guidance at 22; 2021 Clarifications Memo at 15–16.

E. Monitoring Strategy and Other State Implementation Plan Requirements

Section 51.308(f)(6) requires states to have certain strategies and elements in place for assessing and reporting on visibility. Individual requirements under this subsection apply either to states with Class I areas within their borders, states with no Class I areas but that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area, or both. A State with Class I areas within its borders must submit with its SIP revision a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment that is representative of all Class I areas within the State. SIP revisions for such states must also provide for the establishment of any additional monitoring sites or equipment needed to assess visibility conditions in Class I areas, as well as reporting of all visibility monitoring data to the EPA at least annually. Compliance with the monitoring strategy requirement may be met through a state's participation in the Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring network, which is used to measure visibility impairment caused by air pollution at the 156 Class I areas covered by the visibility program. 40 CFR 51.308(f)(6), (f)(6)(i), (f)(6)(iv). The IMPROVE monitoring data is used to determine the 20% most anthropogenically impaired and 20% clearest sets of days every year at each Class I area and tracks visibility impairment over time.

All states' SIPs must provide for procedures by which monitoring data and other information are used to determine the contribution of emissions from within the State to regional haze visibility impairment in affected Class I areas. 40 CFR 51.308(f)(6)(ii), (iii). Section 51.308(f)(6)(v) further requires that all states' SIPs provide for 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 the most recent year for which data are available and estimates of future projected emissions. States must also include commitments to update their inventories periodically. The inventories themselves do not need to be included as elements in the SIP and are not subject to EPA review as part of the Agency's evaluation of a SIP revision.[30] All states' SIPs must also provide for any other elements, including reporting, recordkeeping, and other measures, that are necessary for states to assess and report on visibility. 40 CFR 51.308(f)(6)(vi). Per the 2019 Guidance, a State may note in its regional haze SIP that its compliance with the Air Emissions Reporting Rule (AERR) in 40 CFR part 51 subpart A satisfies the requirement to provide for an emissions inventory for the most recent year for which data are available. To satisfy the requirement to provide estimates of future projected emissions, a State may explain in its SIP how projected emissions were developed for use in establishing RPGs for its own and nearby Class I areas.[31]

Separate from the requirements related to monitoring for regional haze purposes under 40 CFR 51.308(f)(6), the RHR also contains a requirement at § 51.308(f)(4) related to any additional monitoring that may be needed to address visibility impairment in Class I areas from a single source or a small group of sources. This is called ''reasonably attributable visibility impairment.'' [32] Under this provision, if the EPA or the FLM of an affected Class I area has advised a State that additional monitoring is needed to assess reasonably attributable visibility impairment, the State must include in its SIP revision for the second implementation period an appropriate strategy for evaluating such impairment.

F. Requirements for Periodic Reports Describing Progress Towards the Reasonable Progress Goals

Section 51.308(f)(5) requires a state's regional haze SIP revision to address the requirements of paragraphs 40 CFR 51.308(g)(1) through (5) so that the plan revision due in 2021 will serve also as a progress report addressing the period since submission of the progress report for the first implementation period. The regional haze progress report requirement is designed to inform the public and the EPA about a state's implementation of its existing long-term strategy and whether such implementation is in fact resulting in the expected visibility improvement. See 81 FR 26942, 26950 (May 4, 2016); 82 FR at 3119 (January 10, 2017). To this end, every state's SIP revision for the second implementation period is required to describe the status of implementation of all measures included in the state's long-term strategy, including BART and reasonable progress emission reduction measures from the first implementation period, and the resulting emissions reductions. 40 CFR 51.308(g)(1) and (2).

[30] See ''Step 8: Additional requirements for regional haze SIPs'' in 2019 Guidance at 55.

[31] *Id.*

[32] The EPA's visibility protection regulations define ''reasonably attributable visibility impairment'' as ''visibility impairment that is caused by the emission of air pollutants from one, or a small number of sources.'' 40 CFR 51.301.

A core component of the progress report requirements is an assessment of changes in visibility conditions on the clearest and most impaired days. For second implementation period progress reports, § 51.308(g)(3) requires states with Class I areas within their borders to first determine current visibility conditions for each area on the most impaired and clearest days, 40 CFR 51.308(g)(3)(i)(B), and then to calculate the difference between those current conditions and baseline (2000–2004) visibility conditions to assess progress made to date. See 40 CFR 51.308(g)(3)(ii)(B). States must also assess the changes in visibility impairment for the most impaired and clearest days since they submitted their first implementation period progress reports. See 40 CFR 51.308(g)(3)(iii)(B), (f)(5). Since different states submitted their first implementation period progress reports at different times, the starting point for this assessment will vary State by State.

Similarly, states must provide analyses tracking the change in emissions of pollutants contributing to visibility impairment from all sources and activities within the State over the period since they submitted their first implementation period progress reports. See 40 CFR 51.308(g)(4), (f)(5). Changes in emissions should be identified by the type of source or activity. Section 51.308(g)(5) also addresses changes in emissions since the period addressed by the previous progress report and requires states' SIP revisions to include an assessment of any significant changes in anthropogenic emissions within or outside the State. This assessment must explain whether these changes in emissions were anticipated and whether they have limited or impeded progress in reducing emissions and improving visibility relative to what the State projected based on its long-term strategy for the first implementation period.

G. Requirements for State and Federal Land Manager Coordination

Clean Air Act section 169A(d) requires that before a State holds a public hearing on a proposed regional haze SIP revision, it must consult with the appropriate FLM or FLMs; pursuant to that consultation, the State must include a summary of the FLMs' conclusions and recommendations in the notice to the public. Consistent with this statutory requirement, the RHR also requires that states ''provide the [FLM] with an opportunity for consultation, in person and at a point early enough in the State's policy analyses of its long-term strategy emission reduction obligation so that information and recommendations provided by the [FLM] can meaningfully inform the State's decisions on the long-term strategy.'' 40 CFR 51.308(i)(2). Consultation that occurs 120 days prior to any public hearing or public comment opportunity will be deemed ''early enough,'' but the RHR provides that in any event the opportunity for consultation must be provided at least 60 days before a public hearing or comment opportunity. This consultation must include the opportunity for the FLMs to discuss their assessment of visibility impairment in any Class I area and their recommendations on the development and implementation of strategies to address such impairment. 40 CFR 51.308(i)(2). For the EPA to evaluate whether FLM consultation meeting the requirements of the RHR has occurred, the SIP submission should include documentation of the timing and content of such consultation. The SIP revision submitted to the EPA must also describe how the State addressed any comments provided by the FLMs. 40 CFR 51.308(i)(3). Finally, a SIP revision 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. 40 CFR 51.308(i)(4).

IV. The EPA's Evaluation of Texas's Regional Haze Submission for the Second Implementation Period

A. Background on Texas's First Implementation Period SIP Submission

Texas submitted its regional haze SIP for the first implementation period to the EPA on March 31, 2009. The EPA issued a limited disapproval of Texas's RH SIP on June 7, 2012, due to its reliance on the Clean Air Interstate Rule (CAIR) to address BART requirements for Texas electric generating units (EGUs).[33] The EPA proposed a rule to partially approve and partially disapprove Texas's SIP on December 16, 2014;[34] however, due to a related ruling from the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit),[35] the EPA could not finalize the December 2014 proposal in its entirety. As such, the EPA's obligations for the first implementation period for Texas's regional haze SIP were addressed in two separate actions. One action, finalized on January 5, 2016, addressed the regional haze requirements in Texas except for BART requirements for EGUs.[36] The second action, finalized on October 17, 2017, and affirmed on August 12, 2020, addressed BART requirements for Texas EGUs.[37] The EPA has convened separate reconsideration proceedings for both actions.[38] While these proceedings remain ongoing, they do not interfere with the EPA's statutory obligation to take action on Texas's SIP revision for the second implementation period.[39]

The requirements for regional haze SIPs for the first implementation period are contained in 40 CFR 51.308(d) and (e). Pursuant to 40 CFR 51.308(g), Texas was also responsible for submitting a five-year progress report as a SIP revision for the first implementation period, which it did in 2014.[40]

B. Texas's Second Implementation Period SIP Submission and the EPA's Evaluation

In accordance with CAA sections 169A and the RHR at 40 CFR 51.308(f) and (i), on July 20, 2021, Texas submitted a SIP revision to address its regional haze obligations for the second implementation period, which runs through 2028. Texas made its 2021 Regional Haze SIP submission available for public comment on October 9, 2020. Texas received and responded to public comments and included the comments and responses to those comments in their submission.

The following sections describe Texas's RH SIP submission, Texas's assessment of progress made since the first implementation period in reducing emissions of visibility impairing pollutants, and the visibility improvement progress at its Class I areas

[33] 77 FR 33642 (June 7, 2012).

[34] 79 FR 74818 (Dec. 16, 2014).

[35] *EME Homer City Generation, L.P* v. *EPA,* 795 F.3d 118 (D.C. Cir. 2015).

[36] 81 FR 296 (Jan. 5, 2016). In July 2016, the 5th Circuit Court of Appeals issued a stay of the action. *Texas* v. *EPA,* 829 F.3d 405 (5th Cir. 2016). Subsequent to the stay opinion, the EPA requested and the court granted EPA's motion for a partial voluntary remand.

[37] *See* 82 FR 48324 (Oct. 17, 2017); 85 FR 49170 (Aug. 12, 2020).

[38] *See* 88 FR 28918 (May 4, 2023); 88 FR 48152 (July 26, 2023).

[39] EPA is not precluded from acting on a submitted second planning period SIP revision because reconsideration proceedings on first planning period actions remains ongoing. All states had an obligation to submit second planning period SIP revisions by July 31, 2021, regardless of the status of first planning period obligations. After a second planning period SIP revision is submitted to EPA for review, EPA is statutorily required to review and act on that plan within 12 months of the submittal being deemed complete. *See* CAA 110(k)(1); 42 U.S.C. 7410(k)(1). Even with ongoing work on the second planning period, EPA will continue to work to address first planning period obligations.

[40] The EPA has not yet taken action on the progress report SIP.

and nearby Class I areas. This notice also contains EPA's evaluation of Texas's submission against the requirements of the CAA and RHR for the second implementation period of the regional haze program.

C. Identification of Class I Areas

Section 169A(b)(2) of the CAA requires each State in which any Class I area is located or ''the emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility'' in a Class I area to have a plan for making reasonable progress toward the national visibility goal. The RHR implements this statutory requirement at 40 CFR 51.308(f), which provides that each state's plan ''must address regional haze in each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State,'' and (f)(2), which requires each state's plan to include a long-term strategy that addresses regional haze in such Class I areas.

The EPA explained in the 1999 RHR preamble that the CAA section 169A(b)(2) requirement that states submit SIPs to address visibility impairment establishes ''an 'extremely low triggering threshold' in determining which States should submit SIPs for regional haze.'' [41] In concluding that each of the contiguous 48 States and the District of Columbia meet this threshold,[42] the EPA relied on ''a large body of evidence demonstrat[ing] that long-range transport of fine PM contributes to regional haze,'' [43] including modeling studies that ''preliminarily demonstrated that each State not having a Class I area had emissions contributing to impairment in at least one downwind Class I area.'' [44] In addition to the technical evidence supporting a conclusion that each State contributes to *existing* visibility impairment, the EPA also explained that the second half of the national visibility goal—preventing *future* visibility impairment—requires having a framework in place to address future growth in visibility impairing emissions and makes it inappropriate to ''establish criteria for excluding States or geographic areas from consideration as potential contributors to regional haze visibility impairment.'' [45] Thus, the EPA concluded that the agency's ''statutory authority and the scientific evidence are sufficient to require all States to develop regional haze SIPs to ensure the prevention of any future impairment of visibility, and to conduct further analyses to determine whether additional control measures are needed to ensure reasonable progress in remedying existing impairment in downwind Class I areas.'' [46] The EPA's 2017 revisions to the RHR did not disturb this conclusion.[47]

1. Texas Class I Areas

Texas has two mandatory Class I areas within its borders, both of which are located in west Texas. Big Bend National Park (Big Bend) is in Brewster County and borders the Rio Grande and Mexico. Guadalupe Mountains National Park (Guadalupe Mountains) is in Culberson County and borders New Mexico. Both are managed by the National Park Service.

Big Bend was authorized as a national park on June 20, 1935, and established and signed into law on June 12, 1944, as the nation's 27th national park. Big Bend encompasses an area of 801,163 acres, entirely within Brewster County, Texas. For more than 1,000 miles, the Rio Grande forms the boundary between Mexico and the U.S., with Big Bend administering approximately 118 miles along the international boundary. The park gets its name from the course of the Rio Grande, which makes a great bend from a southeasterly to northerly direction in the western portion of Texas. Big Bend has national significance as the largest protected area of Chihuahuan Desert in the continental U.S. The park contains river, desert, and mountain environments.

Guadalupe Mountains was established as a national park on September 30, 1972, and contains Guadalupe Peak, the highest point in Texas at 8,749 feet, and El Capitan, a 1,000 foot-high limestone cliff. Guadalupe Mountains are also part of a mostly buried 400-mile long U-shaped fossil reef complex, Capitan Reef. The park covers more than 86,000 acres and is in the same mountain range of Carlsbad Caverns National Park, which is located about 40 miles to the northeast in New Mexico. Guadalupe Mountains is also located in the Chihuahuan Desert. The park is surrounded by the South Plains to the east and north, Delaware Mountains to the south, and Sacramento Mountains to the west.

2. Identification of Impacted Class I Areas Outside the State

In addition to the two Class I areas in Texas, the TCEQ conducted area of influence analyses (AOIs) paired with emissions-over-distance (Q/d) analyses for 11 Class I areas in other states including Louisiana, Arkansas, Colorado, Missouri, Oklahoma, and New Mexico. The AOIs were generated using ammonium sulfate and ammonium nitrate extinction-weighted residence times (EWRT).[48] The Class I areas included in the analysis from Texas and neighboring states are presented in table 1, which is taken from table 7–3: *Class I Areas included in AOI Analyses* of the 2021 Texas Regional Haze Plan.[49]

TABLE 1—CLASS I AREAS INCLUDED IN AOI ANALYSES OF THE 2021 TEXAS REGIONAL HAZE PLAN

Site	Code	State	County	Latitude	Longitude
Big Bend National Park	BIBE1	TX	48043	29.3027	−103.178
Breton Island	BRIS1	LA	22075	30.10863	−89.76168
Caney Creek	CACR1	AR	05113	34.4544	−94.1429
Great Sand Dunes	GRSA1	CO	08003	37.7249	−105.5185
Guadalupe Mountains National Park	GUMO	TX	48109	31.833	−104.8094
Hercules-Glades	HEG1	MO	29213	36.6138	−92.9221
Mingo	MING1	MO	29207	36.9717	−90.1432

[41] 64 FR at 35721.

[42] The EPA determined that ''there is more than sufficient evidence to support our conclusion that emissions from each of the 48 contiguous States may reasonably be anticipated to cause or contribute to visibility impairment in a Class I area.'' 64 FR at 35721. Hawaii, Alaska, and the U.S. Virgin Islands must also submit regional haze SIPs because they contain Class I areas.

[43] *Id.*

[44] *Id.* at 35722.

[45] *Id.* at 35721.

[46] *Id.* at 35722.

[47] *See* 82 FR at 3094.

[48] 2021 Texas Regional Haze Plan at 7–6. Extinction-weighted residence time is calculated from the time that a particular back-trajectory from a Class I area spent in the grid square containing the individual emission source of interest (residence time) weighted by the extinction coefficient for the visibility precursor (sulfate and nitrate).

[49] For the purposes of the AOI analysis, Carlsbad Caverns was represented by data from the Guadalupe Mountains National Park monitor. *See* 2021 Texas Regional Haze Plan at 1–5.

TABLE 1—CLASS I AREAS INCLUDED IN AOI ANALYSES OF THE 2021 TEXAS REGIONAL HAZE PLAN—Continued

Site	Code	State	County	Latitude	Longitude
Rocky Mountain National Park	ROMO1	CO	08069	40.2783	−105.5457
Salt Creek	SACR1	NM	35005	33.4598	−104.4042
Upper Buffalo Wilderness	UPBO1	AR	05101	35.8258	−93.203
Wheeler Peak	WHPE1	NM	35055	36.5854	−105.42
White Mountain	WHIT1	NM	35027	33.4687	−105.5349
Wichita Mountains	WIMO1	OK	40031	34.7323	−98.713

As explained above, the EPA concluded in the 1999 RHR that ''all [s]tates contain sources whose emissions are reasonably anticipated to contribute to regional haze in a Class I area,'' and this determination was not changed in the 2017 RHR.[50] Critically, the statute and regulation both require that the cause-or-contribute assessment consider all emissions of visibility impairing pollutants from a State, as opposed to emissions of a particular pollutant or emissions from a certain set of sources. Consistent with these requirements, the 2019 Guidance makes it clear that ''all types of anthropogenic sources are to be included in the determination'' of whether a state's emissions are reasonably anticipated to result in any visibility impairment.[51]

While Texas identified Class I areas within and outside of the State that are potentially impacted by Texas sources, Texas did not conduct an AOI analysis for the Bosque del Apache Class I area.[52] Texas justifies this decision based on ''past SIP and FIP documentation'' but provides no additional context or explanation of why that decision remains appropriate for this planning period.[53] In contrast, Texas's CAMx PSAT [54] modeling identified Bosque del Apache as having impacts from Texas sources. According to Texas's PSAT modeling, Texas sources contribute over seven percent of the total visibility impairment at Bosque del Apache.[55] Specifically, the 2021 Texas Regional Haze Plan identifies that the influence due to particulate sulfate from Texas sources is more than five times the influence of New Mexico sources, and the influence due to particulate nitrate from Texas sources is nearly twice the influence of New Mexico sources.[56] Thus, Texas's PSAT modeling suggests that emissions from Texas sources are reasonably anticipated to contribute to visibility impairment at the Bosque del Apache Class I area given the low threshold for visibility impact on Class I areas discussed previously.[57] Therefore, Texas did not complete its obligation under 40 CFR 51.308(f), which provides that each state's plan ''must address regional haze in each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State,'' and (f)(2), which requires each state's plan to include a long-term strategy that addresses regional haze in such Class I areas.

D. Calculations of Baseline, Current, and Natural Visibility Conditions; Progress to Date; and the Uniform Rate of Progress

Section 51.308(f)(1) requires states to determine the following for ''each mandatory Class I Federal area located within the State'': baseline visibility conditions for the most impaired and clearest days, natural visibility conditions for the most impaired and clearest days, progress to date for the most impaired and clearest days, the differences between current visibility conditions and natural visibility conditions, and the URP. This section also provides the option for states to propose adjustments to the URP line for a Class I area to account for visibility impacts from anthropogenic sources outside the United States and/or the impacts from wildland prescribed fires that were conducted for certain, specified objectives.[58]

In Chapter 4 of the 2021 Texas Regional Haze Plan, Texas determines and presents the baseline, natural, and current visibility conditions for both the 20 percent most anthropogenically impaired days and the 20 percent clearest days for the State's two Class I Areas consistent with the EPA's RHR and guidance. In the 2021 Texas Regional Haze Plan, the TCEQ used visibility data from IMPROVE monitoring sites to calculate baseline visibility conditions. Consistent with the RHR, Texas calculated baseline visibility based on data from 2000–2004. For Big Bend specifically, baseline visibility conditions are based on valid data for 2001 through 2004 because 2000 did not meet completeness criteria.[59] Baseline visibility indices for Big Bend and Guadalupe Mountains are presented in the 2021 Texas Regional Haze Plan in table 4–4. In our review, we identified that the information provided by Texas in Chapter 4 of its 2021 Regional Haze Plan as to the baseline and current conditions on the 20 percent clearest days is inconsistent with the IMPROVE monitoring data and information presented in Chapter 8. Based on the information in table 8–42 of the 2021 Regional Haze Plan, Texas identifies the correct data set for where this information is located but presents the incorrect data in Chapter 4. Based on the data source that Texas identified in Chapter 8, we present information in tables 2 and 4 consistent with information in Chapter 8 of its Plan and the IMPROVE monitoring data.[60]

[50] 64 FR at 35721.

[51] 2019 Guidance at 8.

[52] Texas also did not conduct an AOI analysis for the Bandelier Class I area for the same reasons provided for Bosque del Apache.

[53] 2021 Texas Regional Haze Plan, appendix A at 19 of 227; 2021 Texas Regional Haze Plan, Response to Comments at 460 of 653.

[54] Comprehensive Air quality Model with extensions (CAMx) Particulate Source Apportionment Technique (PSAT). CAMx PSAT is capable of tracking source category emissions and separate source regions for certain PM species and precursor emissions. We discuss this further in the Technical Support Document (TSD) for this action, included in the docket.

[55] 2021 Texas Regional Haze Plan, appendix A at 26 of 227.

[56] *See* 2021 Texas Regional Haze Plan, table 8–41 at 8–53; and 2021 Texas Regional Haze Plan, appendix F at F–59 to F–61.

[57] 2021 Texas Regional Haze Plan, appendix F at F–36.

[58] 40 CFR 51.308(f)(1)(vi)(B).

[59] *See* 2021 Texas Regional Haze Plan at 4–4.

[60] *https://views.cira.colostate.edu/fed/. See also* 2020 Data Completeness Memo, table 1.

TABLE 2—ESTIMATE OF BASELINE VISIBILITY CONDITIONS (2000–2004) FOR CLASS I AREAS IN TEXAS

Class I area	Most impaired haze index (dv)	Clearest haze index (dv)
Big Bend	15.57	5.78
Guadalupe Mountains	14.60	5.92

Using the revised IMPROVE algorithm [61] and the methodology described in the 2018 Visibility Tracking Guidance, the TCEQ determined natural visibility conditions for Big Bend and Guadalupe Mountains, presented in table 4–3 of the 2021 Texas Regional Haze Plan, and included in the following table 3.

TABLE 3—ESTIMATE OF NATURAL VISIBILITY CONDITIONS FOR CLASS I AREAS IN TEXAS

Class I area	Most impaired haze index (dv)	Clearest haze index (dv)
Big Bend	5.33	1.62
Guadalupe Mountains	4.83	0.99

The current visibility conditions, which are based on 2014–2018 monitoring data, are presented in the 2021 Texas Regional Haze Plan in table 4–5 with corrected values included in the following table 4.

TABLE 4—ESTIMATE OF CURRENT VISIBILITY CONDITIONS (2014–2018) FOR CLASS I AREAS IN TEXAS

Class I area	Most impaired haze index (dv)	Clearest haze index (dv)
Big Bend	14.06	5.17
Guadalupe Mountains	12.64	4.73

While the 2021 Texas Regional Haze Plan does not specifically present the differences between current visibility conditions and natural visibility conditions as well as the progress to date, we include these calculations using the corrected information in tables 5 and 6.

TABLE 5—PROGRESS TO DATE
(DIFFERENCES BETWEEN BASELINE AND CURRENT CONDITIONS)

Class I area	Most impaired (dv)	Clearest haze (dv)
Big Bend	1.51	0.61
Guadalupe Mountains	1.96	1.19

TABLE 6—DIFFERENCES BETWEEN CURRENT AND NATURAL CONDITIONS

Class I area	Most impaired (dv)	Clearest haze (dv)
Big Bend	8.73	3.55
Guadalupe Mountains	7.81	3.74

The Regional Haze Rule allows states the option to adjust the 2064 glidepath endpoint to account for both international anthropogenic and certain prescribed fire impacts at Class I areas. In the EPA's September 2019 Availability of Modeling Data and Associated Technical Support Document for the EPA's Updated 2028 Visibility Air Quality Modeling memorandum [62] (EPA 2019 Modeling TSD), the EPA used 2028 modeling results to quantify the international and prescribed fire impacts at Class I areas on the 20% most anthropogenically impaired days. Texas used its own CAMx modeling results to adjust the URP to account for international anthropogenic emissions consistent with the approach used by the EPA in the TSD associated with the EPA's Updated 2028 Visibility Air Quality Modeling memorandum. Texas's adjusted URP for Big Bend and Guadalupe Mountains are presented in Figures 8–28 and 8–29 of its 2021 Texas

[61] Marc Pitchford et al., *Revised Algorithm for Estimating Light Extinction from IMPROVE Particle Speciation Data*, j. Air & waste mgmt. Ass'n 1326, 1326–1336 (2007), *https://doi.org/10.3155/1047-3289.57.11.1326*.

[62] Availability of Modeling Data and Associated Technical Support Document for the EPA's Updated 2028 Visibility Air Quality Modeling. *https://www.epa.gov/visibility/technical-support-document-epas-updated-2028-regional-haze-modeling*. The EPA Office of Air Quality Planning and Standards, Research Triangle Park (Sep. 19, 2019).

Regional Haze Plan.[63] Texas's adjusted URP in 2028 on the 20% most impaired visibility days is 14.38 deciviews for Big Bend and 12.81 for Guadalupe Mountains.[64] These values for Big Bend and Guadalupe Mountains are within the range of 2028 adjusted glidepath values provided for in the EPA 2019 Modeling TSD.[65]

The EPA finds that the visibility condition calculations for the two Texas Class I Areas meet the requirements of 40 CFR 51.308(f)(1). Therefore, the EPA proposes to approve the portions of the 2021 Texas Regional Haze Plan relating to 40 CFR 51.308(f)(1).

E. Long-Term Strategy for Regional Haze

Each State having a Class I area within its borders or emissions that may affect visibility in a Class I area must develop a long-term strategy for making reasonable progress towards the national visibility goal.[66] As explained in the Background section of this notice, reasonable progress is achieved when all states contributing to visibility impairment in a Class I area are implementing the measures determined—through application of the four statutory factors to sources of visibility impairing pollutants—to be necessary to make reasonable progress.[67] Each state's long-term strategy must include the enforceable emission limitations, compliance schedules, and other measures that are necessary to make reasonable progress.[68] All new (*i.e.,* additional) measures that are the outcome of four-factor analyses are necessary to make reasonable progress and must be in the long-term strategy. If the outcome of a four-factor analysis and other measures necessary to make reasonable progress is that no new measures are reasonable for a source, that source's existing measures are necessary to make reasonable progress, unless the State can demonstrate that the source will continue to implement those measures and will not increase its emission rate. Existing measures that are necessary to make reasonable progress must also be in the long-term strategy. In developing its long-term strategies, a State must also consider the five additional factors in § 51.308(f)(2)(iv). As part of its reasonable progress determinations, the State must describe the criteria used to determine which sources or group of sources were evaluated (*i.e.,* subjected to four-factor analysis) for the second implementation period and how the four factors were taken into consideration in selecting the emission reduction measures for inclusion in the long-term strategy.[69]

1. Source Selection

a. Overview of Texas's Source Selection

Under 40 CFR 51.308(f)(2)(i), states must evaluate and determine the emission reduction measures that are necessary to make reasonable progress by considering the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected anthropogenic source of visibility impairment.[70] In doing so, states should consider evaluating major and minor stationary sources or groups of sources, mobile sources, and area sources as part of their long-term strategy for regional haze. Furthermore, the State must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated. States may rely on technical information developed by the RPOs of which they are members to select sources for four-factor analysis and to conduct that analysis, as well as to satisfy the documentation requirements under 40 CFR 51.308(f)(2). Texas, however, conducted its own analysis separate from CenSARA's analysis to select sources for further evaluation using the four statutory factors.

Texas focused on sources of NO_X and SO_2 emissions in its control strategy analysis for the second planning period. Texas explained these are the main anthropogenic pollutants that affect visibility at Class I areas in Texas and Class I areas in neighboring states. Texas further stated that, ''on an individual basis, point sources are the largest contributors to SO_2 and NO_X,'' and thus Texas elected to focus on point sources in this planning period.[71]

Texas's source selection methodology relied on a two-step approach. As the first step for source selection, Texas developed areas of influence (AOIs) for thirteen[72] Class I areas (in Texas and nearby states) to identify areas that may contain sources of NO_X and SO_2 that were expected to contribute to visibility impairment at these areas. The AOIs are graphical representations of the extinction weighted residence time (EWRT), which combines air flow patterns with ammonium sulfate and ammonium nitrate extinction measured at IMPROVE monitors at the Class I areas on the 20% most impaired days. The TCEQ used the AOI of a Class I area as a brightline cutoff to define the boundaries within which to further evaluate sources located within that area. As the second step, Texas then applied a Q/d threshold for NO_X and for SO_2 of greater than or equal to five to point sources located within the geographical area of the selected AOI threshold.[73] As a result, any source within the AOI boundaries with a Q/d less than five or any source, regardless of its Q/d, that fell outside of the AOI boundaries were eliminated from further consideration.

Although Texas determined AOIs for 13 Class I areas in Texas and nearby states, Texas's 2021 Regional Haze Plan focused only on those Class I areas where sources with a Q/d greater than or equal to five fell within the AOI boundary.[74] Following this methodology, Texas selected 18 sources for further analysis for only four Class I areas: Wichita Mountains, Caney Creek, Guadalupe Mountains, and Salt Creek.[75]

[63] After Texas adjusted the glidepath endpoint to account for contributions from international anthropogenic emissions, one site (Salt Creek, NM) was projected to be above the adjusted URP. The EPA 2019 Modeling TSD also had Salt Creek above the adjusted glidepath.

[64] 2021 Texas Regional Haze Plan, table 8–43 at 8–59 and table 8–46 at 8–67.

[65] EPA 2019 Modeling TSD at 54, 56, and table 5–2 at 59.

[66] CAA 169A(b)(2)(B).

[67] 40 CFR 51.308(f)(2)(i).

[68] 40 CFR 51.308(f)(2).

[69] 40 CFR 51.308(f)(2)(i), (iii).

[70] *See also* CAA 169A(g)(1).

[71] 2021 Texas Regional Haze Plan at 7–3.

[72] As discussed previously in section IV.C., the monitor for Guadalupe Mountains also serves as the monitor for Carlsbad Caverns in New Mexico.

[73] To calculate the Q/d for point sources, the TCEQ used 2028 projected emissions (Q in tons per year) and distance from the Class I area monitor to the source (d in kilometers). For non-EGUs, Texas estimated 2028 future year emissions from 2016 reported emissions from the State of Texas Air Reporting System (STARS) coupled with growth factors developed by the consulting firm, Eastern Research Group, Inc. (ERG) *See* 2021 Texas Regional Haze Plan at 7–9. For EGUs, the TCEQ used data from the Eastern Regional Technical Advisory Committee (ERTAC) to estimate EGU projections for 2028. *See* 2021 Texas Regional Haze Plan at 7–9.

[74] *See* 2021 Texas Regional Haze Plan, Figure 7–1 at 7–4 and Figure 7–2 at 7–5. Texas stated that those additional AOIs not represented in those figures in the SIP did not add additional sources for consideration. 2021 Texas Regional Haze Plan at 7–6.

[75] *See* Texas 2021 Regional Haze Plan at 7–5 to 7–6. Presented Class I areas are: Caney Creek, Guadalupe Mountains, Salt Creek, and Wichita Mountains for the NO_X analysis, and Caney Creek, Guadalupe Mountains, and Wichita Mountains for the SO_2 analysis.

TABLE 7—TEXAS'S SOURCE SELECTION FOR ITS 2021 REGIONAL HAZE PLAN [76]

Company/site name	Unit(s)	Class I area(s)	Pollutant(s)
Coleto Creek Power/Coleto Creek Power Station.	(1) coal boiler	Wichita Mountains	SO_2.
Southwestern Electric Power/Welsh Power Plant.	(2) coal boilers	Caney Creek & Wichita Mountains.	SO_2.
AEP/Pirkey Power Plant	(1) coal boiler	Caney Creek & Wichita Mountains.	SO_2.
NRG Energy/Limestone Electric Generating Station.	(2) coal boilers	Wichita Mountains	SO_2.
Vistra Energy/Martin Lake Electric Station	(3) coal boilers	Caney Creek & Wichita Mountains.	SO_2.
San Miguel Electric Cooperative/San Miguel Elec. Plant.	(1) coal boiler	Guadalupe Mountains & Wichita Mountains.	SO_2.
Public Service Co. of Oklahoma/Oklaunion Power Station.	(1) coal boiler	Wichita Mountains	SO_2 & NO_X.
Vistra Energy/Oak Grove Steam Electric Station.	(2) coal boilers	Wichita Mountains	SO_2.
Holcim Texas LP/Midlothian Plant	(2) cement kilns	Wichita Mountains	SO_2.
Vitro Flat Glass/Works No. 4 Wichita Falls Plant.	(2) glass melting furnaces	Wichita Mountains	SO_2 & NO_X.
Graphic Packaging International/Texarkana Mill.	(4) boilers: (2) black liquor solids & NG; (1) NG & fuel oil; (1) NG, fuel oil, & other materials.	Caney Creek	NO_X.
El Paso Natural Gas Co./Keystone Compressor Station.	(15) reciprocating engines	Guadalupe Mountains & Salt Creek.	NO_X.
El Paso Natural Gas Co./Cornudas Plant	(6) turbines	Guadalupe Mountains	NO_X.
El Paso Natural Gas Co./Guadalupe Compressor Station.	(1) turbine	Guadalupe Mountains	NO_X.
GCC Permian/Odessa Cement Plant	(2) cement kilns	Guadalupe Mountains	NO_X.
Orion Engineered Carbons/Orange Carbon Black Plant.	(1) incinerator; (4) dryers; (2) tail gas and NG boilers; (1) flare.	Caney Creek	SO_2.
Oxbow Calcining/Oxbow Calcining-Port Arthur.	(4) coke calcining kilns	Caney Creek	SO_2.
Trinity Lightweight Aggregate (TRNLWS)/ Streetman Plant.	(1) lightweight aggregate kiln	Wichita Mountains	SO_2.

b. EPA's Evaluation of Texas's Source Selection Methodology

In identifying the required emission limits, schedules of compliance, and other measures as may be necessary to make reasonable progress toward meeting the national goal, States first select sources for consideration of the four statutory factors.[77] Under the RHR, States have flexibility in conducting their source selection; however, Texas's source selection methodology was neither well-reasoned nor adequately justified.[78] Notably, Texas did not select any sources for further analysis of control measures that may be necessary for inclusion as part of the long-term strategy to make reasonable progress for Big Bend National Park and did not select any SO_2 sources for consideration for Salt Creek. Moreover, the EPA finds the source selection methodology used by Texas was not adequately or accurately described. As such, the threshold Texas applied to define its AOIs was not justified. Without the proper justification, it is unclear how, despite these deficiencies, Texas makes reasonable progress at these Class I areas.

i. The TCEQ Failed To Adequately Describe the Criteria It Used To Select Sources

Under 40 CFR 51.308(f)(2)(i), States are required to include a ''description of the criteria it used to determine which sources or groups of sources it evaluated.'' Based on our review of the 2021 Texas Regional Haze Plan, the methodology Texas described in its SIP to develop its AOIs is inconsistent with, and would not result in, the AOIs presented in Texas's SIP. Texas states in its SIP that the AOIs were determined by dividing the EWRT for each cell by the sum total of all the EWRTs (*i.e.,* EWRT for each cell) across the entire domain.[79] However, based on the documentation the EPA obtained during early engagement in the Fall of 2020 and comparing it to what was in its 2021 Regional Haze Plan, Texas actually divided the EWRT for each cell by the *maximum* EWRT in the domain for each respective pollutant. There was thus an inconsistency between what Texas said its methodology was, and what was in its 2021 Regional Haze Plan submission. Specifically, in the 2020 early engagement document, Texas stated, ''. . . prior to plotting the AOIs, the weighted probabilities were scaled to 1 by dividing the weighted probabilities in each cell by the maximum value in

[76] Texas 2021 Regional Haze Plan, table 7–5.

[77] *See* 40 CFR 51.308(f)(2); CAA 169A(g)(1).

[78] 2019 Guidance at 9, 13. The 2019 Guidance explains that in selecting sources, states must reasonably choose factors and apply them in a reasonable way given the statutory requirement to make reasonable progress towards national goal of preventing future and remedying existing anthropogenic visibility impairment). *See* CAA 169A(b)(2). To that end, the 2019 Guidance recommends that states provide a detailed description of how the state used technical information to select a reasonable set of sources for an analysis of control measures including the basis for the visibility impact thresholds the state used (if applicable), and any other relevant information. *See also* 2021 Clarifications Memo at 3 (''States cannot reasonably determine that they are making reasonable progress if they have not adequately considered the contributors to visibility impairment. Thus, while states have discretion to reasonably select sources, this analysis should be designed and conducted to ensure that source selection results in a set of pollutants and sources the evaluation of which has the potential to meaningfully reduce their contributions to visibility impairment.'').

[79] 2021 Texas Regional Haze Plan at 7–7.

a cell in the domain.'' [80] The EPA compared the plotted AOIs Texas had submitted during the 2020 early engagement period with the plotted AOIs Texas submitted with its 2021 Regional Haze Plan. These AOIs are the same, confirming that, despite what Texas stated in its 2021 Regional Haze Plan, Texas was actually following its articulated methodology in the 2020 early engagement document.

This early engagement information was not included in the proposed SIP Texas published during its state-level notice-and-comment process. Thus, Texas's SIP failed to accurately or adequately describe the criteria actually used in its 2021 Regional Haze Plan submission to determine which sources, or groups of sources, it chose to evaluate for additional control measures as required by 40 CFR 51.308(f)(2)(i). Without an accurate and adequate description of Texas's source selection methodology, it is not clear from its 2021 Texas Regional Haze Plan how Texas evaluated and determined the emission reduction measures that are necessary to make reasonable progress for its second planning period long-term strategy. We discuss the AOI methodologies and these inconsistencies further in the Technical Support Document (TSD) included in the docket for this action.

ii. Texas Failed To Adequately Justify Its AOI Threshold

As noted in the previous section and more fully explained in the EPA's TSD, Texas selected sources using AOIs it developed for each Class I area then followed with a Q/d analysis. The AOIs established a brightline geographic boundary within which Texas selected sources with a Q/d of greater than or equal to five. In other words, Texas did not consider a source, regardless of the size of its emissions, if it was not first within the geographic area defined by the chosen AOI threshold.

To define the brightline geographic boundaries of the AOIs, Texas applied a threshold of 0.1 or 10% of the maximum EWRT value for that AOI.[81] Texas did not provide any discussion or justification for its selection of this threshold, nor did Texas explain how this threshold resulted in evaluating a meaningful set of sources for possible controls measures to improve visibility impairment. Further, Texas did not evaluate whether the selected threshold provided for AOIs that included a sufficiently large area to capture the sources with the highest emissions, or Q/d values, that impact visibility at certain Class I areas. The need for a justification is crucial when a State is applying the threshold as a brightline when selecting sources to evaluate for additional control measures, such as what Texas did here. The AOIs generated from EWRTs represent the general location that air parcels are coming from when visibility extinction is high. However, unless an appropriate threshold value is applied, they do not necessarily capture the specific sources of emissions that are contributing to visibility impairment at the Class I area.[82] Texas's approach did not consider the size or location of point sources, despite articulating a specific focus on point sources,[83] or the total emissions captured to support that their approach and chosen threshold resulted in a reasonable identification of sources for analysis in development of the long term strategy. This problem is evident in Texas's 2021 Regional Haze Plan, where several AOIs contained no sources identified for further consideration and several large emission sources with Q/d values far exceeding Texas's Q/d threshold of five being excluded from further consideration because they were located outside of Texas's generated AOIs.

For example, W A Parish is located just outside of Texas's ammonium sulfate AOIs for both Caney Creek and Wichita Mountains, and outside of Texas's ammonium sulfate AOI for Big Bend.[84] The SO_2 Q/d values for W A Parish are 32.2 for Caney Creek, 28.2 for Wichita Mountains, and 25.1 for Big Bend.[85] Tolk Generating Station is also located outside of Texas's ammonium sulfate AOI for Salt Creek; however, it has a Q/d value of over 84.[86] Ammonium sulfate is the largest contributor to observed light extinction at Salt Creek [87] but Texas did not identify *any* source of SO_2 emissions for further analysis due to the application of their AOI brightline test and selected EWRT threshold, despite the large SO_2 emissions from Tolk and the relative proximity of the facility to Salt Creek.[88] Given the large emissions from these facilities, these sources likely are meaningfully contributing to visibility impairment, even if they happen to fall outside of the chosen Texas AOIs. Based on its analysis of other coal-fired EGUs with no controls or underperforming controls, had Texas selected these sources for further evaluation under the four factors, Texas may have found cost-effective controls available, resulting in emission reductions that may have been necessary for inclusion in its long-term strategy to make reasonable progress toward meeting the national goal. Moreover, Texas did not explain how not evaluating these high-emitting sources nonetheless results in a long-term strategy that makes reasonable progress toward the national goal.

We therefore find Texas's unjustified use of its selected threshold and resulting AOIs as a brightline cutoff in

[80] See ''*README.AOIdevelopmentFor 2021RHSIP_Response_to_EPArequest.20Nov2020 update.docx*'' available in the docket for this action.

[81] Texas discusses its AOI and Q/d analysis in section 7.2.1 of its 2021 Texas Regional Haze Plan.

[82] The 2019 Guidance describes a source selection approach utilizing residence time analysis that selects sources for further analysis by giving each point source a score that takes into account the source's emissions, the daily values of light extinction at a Class I area, the distance between the source and a Class I area, and the relative frequency with which wind trajectories indicate that each source is upwind of the IMPROVE monitoring site. 2019 Guidance at 13. This is the general approach followed by CenSARA and WRAP.

[83] Texas found that on an individual basis point sources are the largest contributors to visibility impairment in Class I areas. 2021 Texas Regional Haze Plan at 7–3.

[84] *See* 2021 Texas Regional Haze Plan, Figure 7–2 at 7–5; AOI for Big Bend located in Texas's EWRT AMDA spreadsheet on TCEQ's AMDA website at *https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/EWRT_AMDA_Pivot_final.xlsx.* This spreadsheet is also available in our docket as ''Texas EWRT AMDA spreadsheet.xlsx''.

[85] *See* ''EPA Q_d Spreadsheet.xlsx'' available in the docket for this action. The information included in the EPA's spreadsheet used information available in our docket as ''Texas EWRT AMDA spreadsheet.xlsx''. *See also* Letter from Arkansas Department of Energy and Environment to TCEQ requesting that TCEQ consider, among other sources, whether performing a four-factor analysis is appropriate for the W A Parish facility in accordance with 40 CFR 51.308(f)(2)(i) due to impacts on Caney Creek based on CenSARA's AOI study (Feb. 4, 2020). The letter is available in Appendix A of Texas's 2021 Regional Haze Plan at 84 of 227. *See also* Letter from Oklahoma Department of Environmental Quality to TCEQ requesting that TCEQ consider further evaluating the W A Parish facility based on its identification that the source is reasonably anticipated to contribute to visibility impairment at the Wichita Mountains Wilderness Area (July 17, 2020). The letter is available in Appendix A of Texas's 2021 Regional Haze Plan at 125 of 227.

[86] *See* AOI for Salt Creek located in ''Texas EWRT AMDA spreadsheet.xlsx'' available in the docket for this action. *See* ''EPA Q_d Spreadsheet.xlsx'' available in the docket for this action. *See also* Letter from New Mexico Environment Department to TCEQ requesting among other things that Texas specifically evaluate the Tolk facility for additional controls based on its impact to Class I areas in New Mexico, including Salt Creek (Feb. 2, 2021). The letter is available in Appendix A of Texas's 2021 Regional Haze Plan at 111 of 227. *See also,* information provided by the FLMs during consultation that Tolk and W A Parish merit further evaluation based on emissions and potential emission reductions available. The information provided by the FLMs is available in Appendix A of Texas's 2021 Regional Haze Plan at 205 of 227.

[87] *See* 2021 Texas Regional Haze Plan, appendix F, Figure 1–60.

[88] EPA used information from Texas's EWRT AMDA spreadsheet, also available in our docket as ''Texas EWRT AMDA spreadsheet.xlsx''. We used the same information to calculate the SO_2 Q/d values for Tolk at White Mountain (56) and at Wheeler Peak (42.7).

source selection to be unreasonable. Texas's methodology resulted in several of the highest emitting SO_2 stationary point sources in the State of Texas not being selected for further evaluation of controls to improve visibility impairment at the Class I areas they likely impact, and in the case of some Class I areas, no sources selected at all for further analysis using the four statutory factors for those areas.

iii. PSAT Modeling Results Further Demonstrate Unreasonableness of Texas's Source Selection Methodology

The 2019 Guidance identifies photochemical modeling and the use of source apportionment modeling as possible methods to assess PM species impacts from sources or groups of sources for source selection.[89] Texas conducted photochemical source apportionment modeling (known as the Particulate Matter Source Apportionment Technology, or PSAT, function of CAMx modeling) as part of its 2021 Regional Haze Plan to evaluate the impact of emissions from source categories on visibility in Class I areas.[90] While Texas did not conduct PSAT modeling for the explicit purpose of source selection, Texas nevertheless included the results of the PSAT modeling in its SIP.[91] The EPA finds Texas's own PSAT modeling results illustrate the flaws in Texas's source selection methodology.

The TCEQ failed to address in its 2021 Regional Haze Plan how its source selection approach and resulting failure to select sources for further analysis to address visibility impairment at Big Bend are consistent with the CAA's statutory goal and Regional Haze Rule requirements.[92] TCEQ's source selection methodology did not identify any sources for further analysis of control measures that may be necessary to include in its long-term strategy to make reasonable progress at Big Bend. The TCEQ's PSAT model results indicate that emissions from Texas anthropogenic sources account for over 10% of the total light extinction at Big Bend, and 67% of the light extinction due to U.S. anthropogenic emissions. [93] The influence from Texas sources on light extinction at Big Bend is approximately double the influence from anthropogenic sources in the rest of the U.S. combined.[94] While Texas states that visibility at Big Bend is heavily influenced by international emissions, the TCEQ has already accounted for this by adjusting the glidepath for its Class I areas to remove visibility impairment from international emissions, consistent with the EPA's guidance, and thus should not be used as a rationale for not evaluating sources for additional control measures. CAA 169A(a)(1), (b)(2) and the RHR require states to make reasonable progress towards addressing anthropogenic impairment from U.S. sources in the second planning period in furtherance of Congress's national goal.

The influence of Texas sources on sulfate and nitrate concentrations at Big Bend shows that emissions from Texas sources are projected to account for approximately 65.4% of the particulate sulfate concentration and 59.3% of the nitrate concentration due to U.S. anthropogenic emissions.[95] The vast majority (93.9%) [96] of the Texas influence on particulate sulfate concentrations at Big Bend can be attributed to Texas anthropogenic emissions from electricity generating unit (EGU) point and non-EGU point sources.[97] Therefore, these data demonstrate that Texas's AOI analysis and threshold selection for Big Bend did not adequately identify the relevant sources that impact visibility impairment for further analysis necessary to develop a long-term strategy to make reasonable progress at Big Bend.

Similarly, Texas's PSAT modeling also underscores inadequacies with its source selection for Class I areas in New Mexico, for example, Salt Creek. As noted above, Texas's AOI analysis for Salt Creek identified no sources of SO_2 in Texas for consideration for further analysis. However, the results of Texas's PSAT modeling show that Texas sources account for almost 12% of the light extinction at Salt Creek.[98] The largest contributor to light extinction at Salt Creek is sulfate.[99] Focusing on modeled U.S. anthropogenic impacts alone, Texas anthropogenic sources account for approximately 51.3% of the particulate sulfate concentrations at Salt Creek.[100] Texas's chosen approach for source selection failed to identify any SO_2 point sources, despite accounting for over half of all the U.S. anthropogenic particulate sulfate concentrations at Salt Creek.

Class I areas like Salt Creek that are not projected to be on or under the glidepath are subject to additional requirements in the RHR. Under 40 CFR 51.308(f)(3)(ii)(B), Texas must provide a robust demonstration that there are no additional emission reduction measures for anthropogenic sources or groups of sources in the State that may reasonably be anticipated to contribute to visibility impairment in the Class I area that would be reasonable to include in its own long-term strategy.[101] The influence from Texas's point sources on particulate sulfate concentrations at Salt Creek is more than double the amount of New Mexico's total (point source, non-point source, and mobile source) influence on particulate sulfate concentrations at Salt Creek.[102] Meaning, SO_2 emissions from Texas sources contribute more to visibility impairment at Salt Creek than SO_2 emissions from New Mexico sources. Given the meaningful contribution to visibility impairment demonstrated by its PSAT modeling, Texas's decision not to select any SO_2 sources for further analysis and consideration of the four statutory factors (or to adequately justify the decision not to select these sources) fails to satisfy the requirement to provide for a robust demonstration for those Class I areas projected to be above the glidepath, as required by 40 CFR 51.308(f)(3)(ii)(B).

iv. EPA's Conclusions and Proposed Action on Source Selection

The EPA finds the source selection methodology used by Texas was not adequately described as required by the RHR.[103] Nevertheless, the EPA was able to discern the state's approach to

[89] 2019 Guidance at 14–15.

[90] 2021 Texas Regional Haze Plan at 8–2.

[91] As explained in our 2019 Guidance, photochemical models are a more detailed and sophisticated technique for evaluating visibility impacts. Photochemical modeling considers the dispersion transformation and deposition processes. Source apportionment can ''tag'' and track emissions sources by any combination of region and sector, or by individual source. As evidenced in Appendix A of Texas's 2021 Regional Haze Plan, Texas had the results of the PSAT modeling at least by March 31, 2020, when Texas presented the results to the FLMs during a consultation meeting.

[92] CAA 169A(a)(1), (b)(2); 40 CFR 51.308(f)(2).

[93] *See* 2021 Texas Regional Haze Plan Figure 8–21 at 8–46.

[94] *See* 2021 Texas Regional Haze Plan Figure 8–21 at 8–46.

[95] *See* 2021 Texas Regional Haze Plan, appendix F, Figure 1–52 at F–54 and Figure 1–53 at F–55.

[96] *See* 2021 Texas Regional Haze Plan, appendix F, Figure 1–52 at F–54.

[97] *See* 2021 Texas Regional Haze Plan, appendix F, Figure 1–52 at F–54.

[98] *See* 2021 Texas Regional Haze Plan, appendix F at F–36.

[99] *See* 2021 Texas Regional Haze Plan, appendix F at F–62.

[100] *See* 2021 Texas Regional Haze Plan, appendix F at F–63.

[101] Texas's own modeling and the EPA's modeling demonstrated that Salt Creek would be above the adjusted glidepath.

[102] *See* 2021 Texas Regional Haze Plan, appendix F, Figure 1–61 at F–63.

[103] 40 CFR 51.308(f)(2)(i) (''The State must evaluate and determine the emission reduction measures that are necessary to make reasonable progress . . . The State must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated'').

developing its AOIs which relied upon drawing a boundary based on a threshold of ten percent of the maximum EWRT values. Texas, however, did not provide any rationale or justification for this ten percent threshold. The boundaries of the AOIs were used as a brightline cutoff, with sources outside the AOIs not given any further consideration. As demonstrated in previous sections, Texas's methodology was unreasonable because it resulted in the selection of no sources for further evaluation at Big Bend and no SO_2 sources for further analysis at Salt Creek. Texas's own PSAT modeling results confirm that its methodology was unreasonable because the results show significant contribution from Texas anthropogenic sources to visibility impairment at Big Bend and Salt Creek. Texas made no attempt to explain the disconnect between its PSAT results and its source selection approach.

The selection of a reasonable set of sources is a necessary first step in identifying the required emission limits, schedules of compliance, and other measures as may be necessary for inclusion in its long-term strategy to make reasonable progress toward meeting Congress's goal of preventing any future, and remedying any existing, impairment at Class I areas after consideration of the four statutory factors.[104] It is evident that developing a long term strategy to make reasonable progress cannot be met, if no sources of pollutants shown to be meaningful contributors to impairment are selected for further evaluation. It is further evident that, at least for Big Bend for both NO_X and SO_2 and for Salt Creek for SO_2, Texas's method of establishing an AOI is not adequate to identify sources of visibility impairment in Texas.

Therefore, the EPA is proposing to disapprove the portion of Texas's 2021 Regional Haze Plan addressing the regulatory requirements of the long-term strategy under 40 CFR 51.308(f)(2).

2. Four Factor Analysis

This section discusses the technical bases and information Texas relied on in the evaluation of emission reduction measures necessary to make reasonable progress in each Class I area affected by emissions from Texas when developing its long-term strategy for the second planning period. As discussed in the preceding section, Texas selected 18 sources for evaluation of emissions reductions necessary to make reasonable progress.[105] If a source triggered analysis for both NO_X and SO_2, control strategies for both pollutants were analyzed separately and concurrently.[106] Of the 18 sources selected for evaluation, eight are EGU sources and 10 are non-EGU sources.

Based on the statutory and regulatory requirements, Texas evaluated emission reduction measures that are necessary to make reasonable progress by considering the four statutory factors listed in CAA § 169A(g)(1) and 40 CFR 51.308(f)(2)(i) for these selected sources. The four statutory factors are (1) the cost of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. This is commonly referred to as ''the four-factor analysis.'' The four statutory factors must be considered when evaluating and determining the emissions reductions measures that are necessary to make reasonable progress.[107] Although visibility impact is not one of the factors required for consideration under the CAA and the RHR, Texas opted to evaluate and consider the visibility benefits from selected control measures evaluated in the four-factor analysis by conducting photochemical sensitivity modeling.[108] In the subsections that follow, we discuss Texas's analysis of the four statutory factors.

a. Identification of Potential Controls

In accordance with EPA's 2019 Guidance, ''the first step in characterizing control measures for a source is the identification of technically feasible control measures for those pollutants that contribute to visibility impairment.'' [109] The EPA's 2019 Guidance does not define the term ''technically feasible;'' however, EPA's Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations (the BART Guidelines) states:

> Control technologies are technically feasible if either (1) they have been installed and operated successfully for the type of source under review under similar conditions, or (2) the technology could be applied to the source under review. Two key concepts are important in determining whether a technology could be applied: ''availability'' and ''applicability.'' . . . a technology is considered ''available'' if the source owner may obtain it through commercial channels, or it is otherwise available within the common sense meaning of the term. An available technology is ''applicable'' if it can reasonably be installed and operated on the source type under consideration. A technology that is available and applicable is technically feasible.[110]

A reasonable four-factor analysis will consider the full range of potentially reasonable options for reducing emissions.[111] In order to provide guidance on what control measures should be included in their four-factor analysis, the RHR Guidance lists examples of different types of control measures that states may consider.[112]

For EGUs without existing controls, Texas considered and evaluated dry sorbent injection (DSI), spray dryer absorber (SDA), and wet limestone scrubbing systems (wet FGD) as potential SO_2 control options, and selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) as potential NOx controls.[113] For EGUs with existing SO_2 controls, Texas considered and evaluated upgrading the control efficiency of the controls to 95%.[114] For non-EGUs, Texas considered various NO_X and SO_2 control options depending on the type of source and whether it had existing controls.[115]

For selected sources where Texas could not identify any feasible control options for a particular source-type, that particular source and pollutant was not further evaluated in the four-factor analysis. Texas stated that it only considered control technologies that have been demonstrated as technically feasible for units at each source type and evaluated those control technologies using available unit-specific data. Texas deemed a given control technology to be ''demonstrated to be technically feasible'' if it was identified in the EPA's Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse or operated in industrial applications for units within an industry type not in a performance ''trial'' phase.[116] Texas further explained that a control measure or technique that has been established as technically demonstrated or feasible

[104] *See* 40 CFR 51.308(f)(2).

[105] 2021 Texas Regional Haze Plan table 7–5 at 7–15.

[106] 2021 Texas Regional Haze Plan at 7–11.

[107] 40 CFR 51.308(f)(2)(i).

[108] 2021 Texas Regional Haze Plan at 7–11.

[109] 2019 Guidance at 22.

[110] 40 CFR part 51, appendix Y, Section D, Step 2.

[111] 2019 Guidance at 22.

[112] 2019 Guidance at 29–30.

[113] 2021 Texas Regional Haze Plan, appendix B at B–1.

[114] 2021 Texas Regional Haze Plan, appendix B at B–1 and B–5 to B–6.

[115] 2021 Texas Regional Haze Plan, appendix B at B–1.

[116] 2021 Texas Regional Haze Plan, appendix B at B–3.

in one industry type was not considered to extend automatically to other industry types. Based on Texas's approach, Texas determined that there were no technically feasible controls for three of the 18 sources selected for further evaluation using the four factors: the Orion Carbon Black facility in Orange County, the Oxbow Calcining facility in Jefferson County, and the Streetman facility in Navarro County. These three determinations are discussed in more detail in the following paragraphs.

Initially we note that Texas's search for available controls relied primarily on the RACT/BACT/LAER Clearinghouse. BACT and LAER are terms associated with EPA's ''New Source Review'' (NSR) permitting program and is triggered when a company is planning to build a new plant or modify an existing plant such that air pollution emissions will increase by a large amount. EPA established the RACT/BACT/LAER Clearinghouse to provide a central data base of air pollution technology information (including past RACT, BACT, and LAER decisions contained in NSR permits) to promote the sharing of information among permitting agencies and to aid in future case-by-case determinations.[117] We note that many of the petroleum coke calcining plants and carbon black plants were constructed prior to the start of EPA's NSR permitting program and have generally not been modified in ways that would trigger the permitting programs.[118] As a result, Texas's reliance on that RACT/BACT/LAER Clearinghouse is not a sufficient search for these types of facilities.

In fact, several groups commented during Texas's state-level comment period that there were technically feasible controls available for petroleum coke calcining facilities similar to the Oxbow facility. For example, commenters referenced a report which includes a discussion of a petroleum coke calcining plant that currently operates a DSI system to control emissions.[119] Additionally, the report identifies a Tesoro facility that operates a semi-dry scrubber combined with a wet electrostatic precipitator that reduces SO_2 emissions in excess of 95%.[120] In response to these comments, Texas stated that:

> The control technology the commenter provided may be technically feasible for petroleum coke calcining manufacturing sites but would not necessarily be considered technically demonstrated directly on the kilns such that this technology could be implemented at Oxbow's Port Arthur facility as suggested by the commenter. The possible control options suggested by the commenter would require modification to a site's operational process such that a potential SO_2 post-combustion control strategy could technically be implemented to control SO_2 emissions from petroleum coke calcining kilns. The TCEQ notes these potential strategies would be implemented downstream of the kiln, or kilns, and not directly on the kiln. The operational process modification would require additional process units to the site to make the potential post-combustion SO_2 control measure technically feasible, thereby increasing capital expenditures not directly associated with the new, additional control measure but necessary for the control measure to effectively function and control SO_2 emissions from the petroleum coke calcining kiln. The TCEQ contends these higher-level control analysis approaches require much broader and resource intensive engineering and economic analyses, and they may not result in the potential control strategy being deemed cost-effective or reasonable and necessary for making reasonable progress for long-term strategies for a planning period.[121]

While Texas's response indicates that such control technologies may not be cost effective based on the modifications that may need to occur at the site, such a determination would necessarily come out of a four-factor analysis; it does not explain why Texas's SIP continued to find that such control measures were not technically feasible.[122] In fact, it acknowledges that such control technologies may be technically feasible. To the extent Texas is relying on the fact that the costs of this control technology would be prohibitive, Texas needed to provide a cost analysis to document and support such an assumption.[123]

Furthermore, information provided by Oxbow during Texas's comment period acknowledge that while there is limited publicly available information there are ''a few commercially operating post-combustion SO_2 controls systems installed on petroleum coke kilns.'' [124] Oxbow also provided a four-factor analysis conducted by Sargent & Lundy.[125] Specifically, Sargent & Lundy concluded that, based on engineering judgment and information from control system vendors, several control technologies were technically feasible and commercially available including: a DSI system with a fabric filter;[126] a spray dryer flue gas scrubber system;[127] a wet limestone scrubbing system;[128] and a circulating dry scrubber system.[129] Despite information provided to Texas to the contrary, the State continued to find that control technologies were not technically feasible. Therefore, Texas's determination that such control technologies were not technically feasible for petroleum coke calcining facilities was not reasonable. As a result, because Texas selected this source for further evaluation of control measures, it was unreasonable for Texas to not take into consideration the four statutory factors to determine whether there were cost-effective measures that were thus necessary for reasonable progress in fulfillment of their long-term strategy requirements for the second planning period.[130]

Texas received similar comments regarding Texas's determination that there were no feasible controls for the Orion carbon black plant. Notably, the commenter states that the EPA had entered into consent decrees with several carbon black manufacturing companies that required control of SO_2 emissions to 95%.[131] In response to these comments, Texas stated that while these consent decrees required certain control efficiencies, installing controls on carbon black facilities had yet to be demonstrated in practice. However, the EPA entered into a consent decree with

[117] *See* RACT/BACT/LAER Clearinghouse (RBLC) Basic Information available at *https://www.epa.gov/catc/ractbactlaer-clearinghouse-rblc-basic-information.*

[118] *See, e.g.,* Port Arthur Steam Energy/Oxbow Corp., available at *https://chptap.ornl.gov/profile/186/Port_Arthur_Steam-Project_Profile.pdf.*

[119] Bay Area Air Quality Management District Regulation 9, Rule 14 Report at 4, 9 (Oct. 2015).

[120] Bay Area Air Quality Management District Regulation 9, Rule 14 Report at 11 (Oct. 2015).

[121] 2021 Texas Regional Haze Plan, Response to Comments, at 481–482 of 653.

[122] See EPA's TSD for this action, available in the docket, for additional information regarding the installation and operation of controls on petroleum coke calcining plants.

[123] 40 CFR 51.308(f)(2)(iii).

[124] Oxbow Comments on 2021 Texas Regional Haze Plan, at 306 of 653. According to a 2022 technical support document (TSD) prepared by EPA, there are only approximately 15 petroleum coke calcining facilities operating in the United States. The EPA 2022 TSD is available in the docket for this action.

[125] Oxbow Comments on 2021 Texas Regional Haze Plan, Report from Sargent & Lundy at 312 of 653.

[126] Oxbow Comments on 2021 Texas Regional Haze Plan, Report from Sargent & Lundy at 338 of 653.

[127] Oxbow Comments on 2021 Texas Regional Haze Plan, Report from Sargent & Lundy at 336 of 653.

[128] Oxbow Comments on 2021 Texas Regional Haze Plan, Report from Sargent & Lundy at 334 of 653.

[129] Oxbow Comments on 2021 Texas Regional Haze Plan, Report from Sargent & Lundy at 336 of 653.

[130] We discuss additional examples of existing controls at coke calcining facilities in the TSD for this action, included in the docket.

[131] *See* 2021 Texas Regional Haze SIP, Comments by Sierra Club, et al., on Texas's Regional Haze SIP at 253 of 653.

the carbon black manufacturing company Cabot, which required the installation of wet gas scrubbers to control SO_2 emissions from their carbon black units. While the compliance dates were delayed,[132] Cabot completed construction of the wet gas scrubber at its Canal Plant in 2020.[133] Thus, the available information identifies technically feasible and available control technologies for carbon black facilities. Therefore, Texas's determination that no control technologies were technically feasible was unreasonable. Texas should have conducted a four-factor analysis for the Orion carbon black plant considering these available controls to determine whether cost-effective control measures were necessary for reasonable progress in fulfillment of its long-term strategy requirements.

Texas also received comments during Texas's state-level public comment period that there were technically feasible controls identified for lightweight aggregate plants like Streetman's plant.[134] Specifically, commenters referenced EPA's AP–42 emission factor documentation [135] for lightweight aggregate manufacturing. Among other information, the document identifies that emissions from kilns at these lightweight aggregate facilities are controlled with wet scrubbers as well as fabric filters and electrostatic precipitators (ESPs). In response to this information, Texas stated that review of the data and information in the EPA's AP–42 emission factor dataset led the TCEQ to conclude that ''while wet scrubbers designed for PM control may result in some emissions reductions of SO_2, the TCEQ does not view this as a control strategy for the direct control of SO_2 that could result in meaningful SO_2 emissions reductions.'' [136]

While the EPA's AP–42 emission factor documentation discusses the use of scrubbers to control PM emissions, it also provides information and emission factors related to the control of SO_2 emissions from the installation of wet scrubbers.[137] Several of the studies referenced in the documentation were done to measure SO_2 emissions.[138] This information together shows reductions in emissions of SO_2 from the installation of wet scrubbers at lightweight aggregate plants.[139] Regardless of whether the main pollutant of concern from these types of facilities is PM or SO_2, Texas does not adequately or reasonably explain how a proven control technology, installed within the same industry type and for which reduces the pollutant of concern (SO_2), becomes technically infeasible based on the fact that it also reduces PM. Texas's determination that there were no technically available controls for lightweight aggregate plants such as the Streetman facility was unreasonable and unsupported by information provided to Texas during its public comment period.[140] Therefore, it was unreasonable for Texas not to have evaluated potential control measures for the Streetman facility using the four statutory factors to determine whether control measures were necessary for reasonable progress in fulfillment of their long-term strategy requirements.

b. Cost of Compliance

Texas evaluated the cost of compliance for each control option determined to be technically feasible for each selected EGU and non-EGU to arrive at an annualized cost and cost per ton of emissions reduced ($/ton), also referred to as a cost-effectiveness calculation, for each control option.[141] Texas stated that as part of the cost analysis, individual units at a source selected for evaluation with NO_X or SO_2 emissions of less than five percent of the facility's total emissions of the same pollutant were eliminated from further analysis.[142] Texas explained that excluding such units with smaller emissions is reasonable with respect to application of the cost of compliance criterion because controlling these smaller units would not be justified at this time considering both the cost to control and the anticipated improvement in visibility. Using this approach, Texas focused on the units with relatively greater NO_X and SO_2 emissions at a given source.

In the cost analysis for EGUs without existing controls, Texas stated it estimated the capital cost and annual operating and maintenance costs of technically feasible air pollution control options using the most recent data available from Sargent & Lundy.[143] In the cost analysis for upgrading scrubbers at EGUs, Texas provided an example cost, but did not explain how that example was used.[144] In the cost analysis for non-EGUs, Texas stated it estimated the capital cost and annual operating and maintenance costs of technically feasible air pollution control options using cost data and information from the EPA and available industry literature.[145] For one non-EGU source, the Works No. 4 Glass Plant, Texas relied on vendor cost information for capital cost and annual operating and maintenance costs of control equipment.[146] For all sources, Texas estimated annualized capital costs by multiplying the capital costs by the capital recovery factor.[147] The capital recovery factor accounts for source financing of air pollution control equipment and is based on the assumed equipment life and interest rate. Texas stated that ''capital recovery factors were estimated using the techniques listed in the EPA's Control Cost Manual'' where it found appropriate.[148] Texas estimated the capital recovery factor assuming an interest rate of 10 percent and an equipment life of five, 15, and 30 years. Ultimately, Texas chose to base its cost analysis on a

[132] *See, United States of America, et al.* v. *Cabot Corporation*, Civil Action Number 6:13–cv–03095 (W.D. LA), Second Amendment to Consent Decree (filed Dec. 22, 2017) and available in the docket for this action.

[133] *See* Cabot press release dated June 26, 2020, regarding the successful installation of control technologies, available at *https://investor.cabot-corp.com/node/21156.*

[134] *See* 2021 Texas Regional Haze Plan, Comments by Sierra Club, et al. on Texas's Regional Haze SIP at 252 of 653.

[135] AP–42 emission factors are published by EPA and serve as the primarily compilation of emission factor information. The various chapters contain emissions factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emissions factors have been developed and compiled from source test data, material balance studies, and engineering estimates. *See* AP–42: Compilation of Air Emissions Factors from Stationary Sources available at *https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources* for more information.

[136] 2021 Texas Regional Haze Plan, Response to Comments at 482–483 of 653.

[137] AP–42, section 11.20 available at *https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-fifth-edition-volume-i-chapter-11-mineral-products-0* and in the docket for this action.

[138] *See* AP–42, section 11.20 *See also* AP–42 section 11.20 at pgs. 5, 10–12.

[139] *See* AP–42, section 11.20, table 4–13, Emission factors for rotary kilns without a scrubber are 5.6 lbs SO_2/ton feed, with a scrubber 3.4 lbs SO_2/ton feed.

[140] *See* 2021 Texas Regional Haze Plan, Comments by Sierra Club, et al, on Texas's Regional Haze SIP at 252 of 653. *See also* 2021 Texas Regional Haze Plan, appendix A at 206 of 227.

[141] 2021 Texas Regional Haze Plan, appendix B.

[142] 2021 Texas Regional Haze Plan, appendix B at B–3.

[143] 2021 Texas Regional Haze Plan at 7–11 to 7–12.

[144] 2021 Texas Regional Haze Plan, appendix B at B–12.

[145] 2021 Texas Regional Haze Plan, appendix B at B–12.

[146] 2021 Texas Regional Haze Plan, appendix B at B–7 to B–8, B–12.

[147] 2021 Texas Regional Haze Plan, appendix B at B–14.

[148] 2021 Texas Regional Haze Plan, appendix B at B–14.

capital life of 15 years for all selected sources.[149]

Texas stated that annual operating and maintenance costs associated with each control option evaluated ''were estimated from the same data and information used for estimating capital costs for each source.'' [150] Texas added the annualized capital cost and the annual operating and maintenance cost to arrive at the total annualized cost for each control option for each source.[151] After estimating the potential emission reductions of each control option using baseline emissions from the EPA's 2018 Clean Air Markets Program Data (AMPD) emission data for EGUs and 2016 TCEQ point source emission inventory data for non-EGUs, the total annualized cost was divided by the tons of pollutant emissions reduced to estimate the cost per ton of emissions reduced ($/ton), or cost-effectiveness.[152] Texas then applied a cost-effectiveness ($/ton) threshold of $5,000/ton for NO_X and SO_2 emissions reduced to eliminate controls from further consideration by explaining that this allowed for the identification of sources to which potential control measures could be applied cost-effectively.[153] The results of Texas's cost analysis are presented in the following tables.[154]

TABLE 8—TEXAS'S COST ESTIMATES OF SO_2 CONTROLS FOR EGUS WITHOUT EXISTING CONTROLS

Source	SO_2 baseline emissions (tons/yr)	Control	Control efficiency (%)	SO_2 reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Coleto Creek Unit 1	13,213	DSI	90	11,892	$3,261	$3,022	$2,976
		SDA	95	12,552	6,720	3,884	3,340
		Wet FGD	98	12,949	7,406	4,215	3,603
Welsh Unit 1	7,528	DSI	90	6,775	4,406	4,029	3,957
		SDA	95	7,152	11,380	6,481	5,540
		Wet FGD	98	7,377	12,032	6,812	5,811
Welsh Unit 3	6,694	DSI	90	6,025	4,814	4,394	4,314
		SDA	95	6,359	12,622	7,179	6,135
		Wet FGD	98	6,560	13,357	7,558	6,445

TABLE 9—TEXAS'S COST ESTIMATES OF SO_2 WET SCRUBBER UPGRADES FOR EGUS

Source	Unit size (MW)	SO_2 baseline emissions (tons/yr)	Capital cost ($)	Annual operating and maintenance costs ($)	SO_2 reduction due to scrubber upgrade at 95% control efficiency (tons/yr)	Cost-effectiveness ($/ton)		
						5-Year life	15-Year life	30-Year life
AEP Pirkey Unit 1	721	5,085	99,921,030	2,740,188	3,874	$7,511	$4,098	$3,443
Limestone Unit 1	893	4,156	123,757,947	3,393,881	3,212	11,222	6,123	5,145
Limestone Unit 2	957	4,164	132,627,498	3,637,115	3,259	11,853	6,467	5,434
Martin Lake Unit 1	793	19,282	109,899,275	3,013,827	16,172	1,979	1,080	907
Martin Lake Unit 2	793	17,167	109,899,275	3,013,827	14,101	2,270	1,238	1,040
Martin Lake Unit 3	793	19,749	109,899,275	3,013,827	16,458	1,945	1,061	891
San Miguel Unit 1	410	12,006	56,820,558	1,558,221	2,001	8,270	4,512	3,791
Oklaunion Unit 1	720	2,191	99,782,444	2,736,387	1,826	15,913	8,682	7,295

TABLE 10–TEXAS'S COST ESTIMATES OF NO_X CONTROLS OKLAUNION UNIT 1

Source	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Oklaunion Unit 1	6,804	SNCR	50	3,402	$4,705	$4,152	$4,046
		SCR	98	6,668	11,222	6,455	5,541

TABLE 11—TEXAS'S COST ESTIMATE OF SO_2 WET SCRUBBER UPGRADES FOR MIDLOTHIAN PLANT

Unit	SO_2 baseline emissions (tons/yr)	Baseline SO_2 control efficiency of wet scrubber (%)	Capital cost ($)	Annual operating and maintenance costs ($)	SO_2 reduction due to scrubber upgrade at 95% control efficiency (tons/yr)	Cost-effectiveness ($/ton)		
						5-Year life	15-Year life	30-Year life
Cement Kiln No 1	522	90	8,196,683	224,782	261	$9,138	$4,986	$4,189
Cement Kiln No 2	856	90	8,300,438	227,627	428	5,647	3,081	2,589

[149] 2021 Texas Regional Haze Plan, appendix B at B–14.

[150] 2021 Texas Regional Haze Plan, appendix B at B–14.

[151] 2021 Texas Regional Haze Plan, appendix B at B–14.

[152] 2021 Texas Regional Haze Plan, appendix B at B–14.

[153] 2021 Texas Regional Haze Plan, appendix B at B–15.

[154] The information contained in tables 8 through table 17 are presented in the 2021 Texas Regional Haze Plan, appendix B at B–16–B–42.

TABLE 12—TEXAS'S COST ESTIMATE OF TRI-MER CAT CONTROLS FOR VITRO FLAT GLASS WORKS NO 4 PLANT

Unit	Pollutant evaluated	Baseline emissions (tons/yr)	Control efficiency evaluated (%)	Emissions reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Glass Melting Furnace Line No.1	SO_2	136	80	109	$15,100	$10,300	$9,400
	NO_X	674	80	539	15,100	10,300	9,400
Glass Melting Furnace Line No. 2	SO_2	301	80	241	4,600	3,200	2,900
	NO_X	2,533	80	2,026	4,600	3,200	2,900

TABLE 13—TEXAS'S COST ESTIMATES OF NO_X CONTROLS FOR GRAPHIC PACKAGING TEXARKANA MILL

Unit	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Power Boiler No 1	109	LNB	40	44	$21,788	$10,859	$8,762
		SCR	80	87	36,200	26,350	24,469
Power Boiler No 2	692	LNB	40	277	3,525	1,757	1,417
		SCR	80	554	7,100	5,254	4,956
Recovery Boiler/Furnace No 1	275	LNB	40	110	7,438	3,707	2,991
		SCR	80	220	11,800	9,248	8,755
Recovery Boiler/Furnace No 2	674	LNB	40	270	3,619	1,804	1,455
		SCR	80	539	7,000	5,395	5,089

TABLE 14—TEXAS'S COST ESTIMATES OF NO_X CONTROLS FOR EL PASO NATURAL GAS COMPANY KEYSTONE COMPRESSOR STATION

Unit	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Reciprocating Internal Combustion Engine, A01.	131	LEC	40	53	$1,091	$544	$439
		SCR	80	105	7,956	6,754	6,523
Reciprocating Internal Combustion Engine, A02.	7	LEC	40	3	19,209	9,573	7,724
		SCR	80	6	129,200	108,036	103,974
Reciprocating Internal Combustion Engine, A03.	133	LEC	40	53	1,078	537	433
		SCR	80	106	7,900	6,677	6,449
Reciprocating Internal Combustion Engine, A04.	14	LEC	40	6	9,989	4,978	4,017
		SCR	80	11	67,500	56,494	54,381
Reciprocating Internal Combustion Engine, A05.	24	LEC	40	10	5,964	2,972	2,398
		SCR	80	19	40,600	33,990	32,729
Reciprocating Internal Combustion Engine, A06.	17	LEC	40	7	8,664	4,318	3,484
		SCR	80	13	58,600	49,085	47,253
Reciprocating Internal Combustion Engine, A07.	14	LEC	40	6	10,278	5,122	4,133
		SCR	80	11	69,400	58,102	55,928
Reciprocating Internal Combustion Engine, A08.	18	LEC	40	12	4,851	2,418	1,915
		SCR	80	24	33,100	27,769	26,743
Reciprocating Internal Combustion Engine, A09.	16	LEC	40	6	9,154	4,562	3,681
		SCR	80	13	61,900	51,821	49,885
Reciprocating Internal Combustion Engine, A10.	60	LEC	40	24	2,377	1,185	956
		SCR	80	48	16,600	13,940	13,437
Reciprocating Internal Combustion Engine, A11.	34	LEC	40	14	4,178	2,083	1,680
		SCR	80	27	28,600	24,011	23,127
Reciprocating Internal Combustion Engine, A12.	8	LEC	40	3	18,554	9,247	7,461
		SCR	80	6	124,800	104,367	100,443
Reciprocating Internal Combustion Engine, B01.	29	LEC	40	12	6,727	3,353	2,705
		SCR	80	23	39,100	32,227	30,914
Reciprocating Internal Combustion Engine, B02.	83	LEC	40	33	2,365	1,179	951
		SCR	80	66	14,200	11,755	11,293
Reciprocating Internal Combustion Engine, B03.	66	LEC	40	26	2,958	1,474	1,189
		SCR	80	53	17,600	14,543	13,965

TABLE 15—TEXAS'S COST ESTIMATES OF NO_X CONTROLS FOR EL PASO NATURAL GAS COMPANY CORNUDAS PLANT

Unit	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Gas Turbine, A1	69	LNB	40	28	$1,913	$954	$769
		SCR	80	55	27,700	21,972	20,879
Gas Turbine, A2	50	LNB	40	20	5,823	2,902	2,341
		SCR	80	40	37,742	29,958	28,464
Gas Turbine, A3	63	LNB	40	25	4,623	2,304	1,859
		SCR	80	51	30,292	24,112	22,926
Gas Turbine, B1	104	LNB	40	42	3,748	1,868	1,507
		SCR	80	83	22,878	17,982	17,042
Gas Turbine, C1	18	SCR	80	14	129,955	101,694	96,270

TABLE 15—TEXAS'S COST ESTIMATES OF NO_X CONTROLS FOR EL PASO NATURAL GAS COMPANY CORNUDAS PLANT—Continued

Unit	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Gas Turbine, C2	18	SCR	80	14	129,955	101,694	96,270

TABLE 16—TEXAS'S COST ESTIMATES OF NO_X CONTROLS FOR EL PASO NATURAL GAS COMPANY GUADALUPE COMPRESSOR STATION

Unit	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Gas Turbine, C–1	56	LNB	40	23	$13,897	$6,926	$5,588
		SCR	80	45	69,485	54,975	52,190

TABLE 17—TEXAS'S COST ESTIMATES OF NO_X CONTROLS FOR GCC PERMIAN ODESSA CEMENT PLANT

Unit	NO_X baseline emissions (tons/yr)	Control	Control efficiency (%)	NO_X reduction (tons/yr)	5-Year life cost-effectiveness ($/ton)	15-Year life cost-effectiveness ($/ton)	30-Year life cost-effectiveness ($/ton)
Cement Kiln No 2	427	LNB	40	171	$3,163	$1,576	$1,272

i. Texas Did Not Adequately Document the Technical Basis and Cost Information on Which It Based Its Cost of Compliance Analyses as Required by the Regional Haze Rule

Texas did not adequately document the technical basis and cost information on which it based its evaluation of the cost of compliance for all control measures considered as required by the Regional Haze Rule.[155] The SIP submittal discusses Texas's general approach for estimating the cost of the various control options considered, but only provides sum total estimates of the capital costs and annual operating and maintenance costs without providing individual line items or calculations for review. Texas received comments during the State's public comment period on the proposed Texas RH SIP for the second planning period stating that the proposed SIP did not include proper documentation of the cost estimates of the various control measures, including the actual spreadsheets showing the calculations that inform the results of the cost analyses as part of the TCEQ's four-factor analysis.[156] Despite these comments, Texas did not directly address why calculation spreadsheets and other necessary documentation of the cost analysis were omitted from the proposed SIP, nor did Texas make changes to the final SIP submittal or include adequate documentation of the cost analysis in the final SIP submittal in response to these comments. With respect to the capital and annual costs of scrubber upgrades, Texas provided one additional piece of information in its response stating that it relied on prior studies and work conducted on potential scrubbing system upgrades to estimate the capital and annual costs to inform total annualized costs.[157] However, the response does not explain what ''prior studies and work conducted on potential scrubbing system upgrades'' it relied on or how it relied on those studies to estimate the capital and annual cost of scrubber upgrades. This documentation is critical to ensuring that Texas's consideration of cost of potential control measures, as required by the RHR and the CAA,[158] was reasonable and based on sufficiently reliable information.[159]

The EPA has recommended that costs of compliance and the remaining useful life should be calculated consistent with the methods set forth in the EPA's Control Cost Manual in order to allow for comparisons between different sources within a State, and cost analyses in other states.[160] To that end, states relying on EPA's Control Cost Manual need only reference the manual as the documentation necessary to meet the requirements of the RHR to document the technical basis, including cost information, on which the State is relying.[161] When a State uses cost methods other than the EPA's Control Cost Manual, it is necessary for those differences to be reasonable and sufficiently documented to meet the requirements of the RHR to document the technical basis, including cost information, on which the State is relying.[162] In response to comments, Texas acknowledged that it deviated from EPA's Control Cost Manual in certain instances, but failed to provide adequate documentation and justification of its costs in light of its deviations.[163]

One important element of a cost analysis is the remaining useful life of

[155] 40 CFR 51.308(f)(2)(iii).

[156] 2021 Texas Regional Haze Plan, Response to Comments at 478–479 of 653.

[157] 2021 Texas Regional Haze Plan, Response to Comments at 479 of 653.

[158] *See* 40 CFR 51.308(f)(2)(i) (''The State must evaluate and determine the emission reduction measures that are necessary to make reasonable progress by considering the costs of compliance . . .''); CAA 169A(g)(1) (''in determining reasonable progress, there shall be taken into consideration the costs of compliance . . .'').

[159] As discussed in the following section, the EPA requested the additional supporting information from Texas. In response, Texas provided additional files and spreadsheets to EPA upon request. However, the public did not have access to these files during the state-level comment period and therefore did not have an opportunity to review or comment on the complete technical basis of Texas's cost analyses.

[160] 2019 Guidance at 31. As we have previously noted in relation to BART determinations, ''[w]ithout an 'apples-to-apples' comparison of costs, it is impossible to draw rational conclusions about the reasonableness of the costs of compliance for particular control options. Use of the [Control Cost Manual] methodology is intended to allow a fair comparison of pollution control costs between similar applications for regulatory purposes.'' 77 FR 72512, 72518.

[161] 2019 Guidance at 31.

[162] 40 CFR 51.308(f)(2)(iii); 2019 Guidance at 31.

[163] *See* 2021 Texas Regional Haze Plan, Response to Comments at 472 of 653.

the equipment. This is important because equipment life, while related to the ''remaining useful life'' factor of the four-factor analysis, also factors into the consideration of cost of compliance due to the annualization of cost in estimating the cost-effectiveness ($/ton reduced). The EPA's 2019 Guidance explains that, generally, states can consider the remaining useful life factor by considering the useful life of the control system.[164] Typically, the remaining useful life of the source itself will be longer than the useful life of the emission control system under consideration. Thus, annualized costs of compliance are typically based on the useful life of the control equipment rather than the life of the source, unless the source is under an enforceable requirement to cease operation or otherwise reduce its emissions (*i.e.,* switching from coal to natural gas).[165]

The Control Cost Manual generally assumes a remaining useful life of equipment of 30 years for scrubbers and SCR.[166] Texas, however, assumed a remaining useful equipment life of 15 years for all sources.[167] Texas explained that some of the sources it evaluated in the four-factor analysis could not reasonably be expected to operate an additional 30 years,[168] but that most could reasonably be expected to continue to operate longer than five years. Therefore, Texas determined that a remaining useful life of 15 years was a reasonable ''mid-point'' to use in the four-factor analysis. However, Texas did not provide any specific documentation to support its determination that all of the sources it selected could not reasonably expected to operate an additional 30 years nor did it point to any enforceable commitments to retire or otherwise reduce its emissions contained in the SIP. The selection of a 15-year useful life inflates the cost of controls because those costs are amortized over a shorter period of time, thereby increasing the calculated annualized cost and the cost-effectiveness ($/ton reduced). This impacted Texas's identification of cost-effective controls and ultimately, their assessment of aggregate annualized costs. For example, Texas considered SCR as a potential NO_X control for the Texarkana Mill.[169] Using a 15-year equipment life resulted in an annualized capital cost for SCR on Boiler No. 2 of $853,383 and a cost effectiveness of $5,254 ($/ton).[170] Using a 30-year equipment life resulted in an annualized capital cost of $688,550 and a cost effectiveness of $4,956 ($/ton).[171] Because Texas used a cost-effectiveness threshold of $5,000, Texas did not further consider SCR for Boiler No. 2 in determining what measures may be necessary to include in the long-term strategy in order to make reasonable progress.[172]

Another important element of the cost analysis is the interest rate used. According to the EPA's Control Cost Manual, if a company-specific interest rate is not available for use in evaluating the cost of controls in the four-factor analysis, the use of the current bank prime rate is the appropriate default.[173] The bank prime rate is reflective of the typical rate for borrowing among large firms. The bank prime rate was 3.25 percent for at least six months leading up to Texas's public comment period,[174] and remained so when Texas submitted the final SIP to the EPA in July 2021.[175] Texas instead used a 10 percent interest rate, assuming that industrial sources could not obtain the bank prime rate. However, Texas did not provide any documentation to support this general assertion. In addition, the use of the higher 10 percent interest rate serves to increase the total annualized cost.

Finally, based on Texas's response to comments, Texas included certain costs inconsistent with the ''overnight'' cost methodology used in the EPA's Control Cost Manual, which resulted in increased costs for the control options considered. However, it is unclear from the information included in Texas's SIP submission, how and for which sources Texas included these costs. In the absence of adequate documentation and justification to support the basis for its cost analysis, we find that Texas's cost analyses are not sufficiently reliable to support its control determinations.

Thus, we find that Texas did not adequately document the technical basis and cost information on which it based its evaluation of the cost of compliance of controls, which is a RHR requirement under 40 CFR 51.308(f)(2)(iii). Without this information, it is unclear how Texas's methodology results in a long-term strategy that includes all measures necessary for reasonable progress in the Second Planning Period.

ii. Texas's Cost Analysis for Scrubber Upgrades Was Unsupported and Unreasonable

Texas's cost analysis of SO_2 scrubber upgrades for EGUs was unreasonable because many assumptions made by Texas in estimating the cost of scrubber upgrades were inadequately justified and based on outlier information that led to unreliable and inflated cost estimates. As explained in the previous section, the 2021 Texas Regional Haze Plan did not document or adequately explain Texas's methodology for estimating the capital costs and operation and maintenance costs of scrubber upgrades, which is a requirement under 40 CFR 51.308(f)(2)(iii).[176] Rather, the 2021

[164] *See* 2019 Guidance at 33.

[165] *See* 2019 Guidance at 33.

[166] Equipment life can depend on the type of equipment. For example, the EPA's Control Cost Manual provides for an assumed 30 year equipment life for scrubbers, but a 20 year equipment life for SNCR. The Control Cost Manual and associated spreadsheets are available at *https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution,* select portions of which are included in the docket for this action.

[167] 2021 Texas Regional Haze Plan, appendix B at B–14—B–15.

[168] We are aware that Pirkey and Oklaunion have ceased operations. However, the EPA is not aware that these permits have been voided. We are also aware that other sources such as Coleto Creek and Welsh have publicly stated an intention to retire or convert to natural gas. Coleto Creek has announced its anticipated retirement in 2027 and Welsh has announced that it will convert to natural gas by 2028. These announcements are not an enforceable commitment to retire the units by a date certain and Texas has not asked to make those retirements federally enforceable and permanent by including them in the SIP. Therefore, when considering the fourth statutory factor, these announcements cannot be used to shorten the remaining useful life of the sources. *See* Vistra Announces Plans to Add Up to 2,000 MW of Gas-Fueled Dispatchable Power in ERCOT available at *https://investor.vistracorp.com/2024-05-30-Vistra-Announces-Plans-to-Add-Up-to-2,000-MW-of-Gas-Fueled-Dispatchable-Power-in-ERCOT;* AEP Schedule of Closures available at *https://aepcommunitytransition.com/closures/.*

[169] 2021 Texas Regional Haze Plan, appendix B at B–28.

[170] 2021 Texas Regional Haze Plan, appendix B at B–28.

[171] 2021 Texas Regional Haze Plan, appendix B at B–28.

[172] 2021 Texas Regional Haze Plan, appendix B at B–28. The difference in emission reductions between SCR and low-NO_X burners is 277 tpy.

[173] The EPA Air Pollution Control Cost Manual (the Control Cost Manual, or Manual), (November 2017), section 1, Chapter 2 at 16. The Control Cost Manual is available at *https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution.*

[174] We acknowledge that the current bank prime rate is higher than the rate at the time Texas submitted its SIP, however, at no point has the bank prime rate reached 10 percent. A historical record of the bank prime rates is available at *https://fred.stlouisfed.org/series/PRIME.* Texas's public comment period on the proposed 2021 Texas Regional Haze Plan for the second planning period took place from October 9, 2020, to January 8, 2021.

[175] *See* Bank Prime Loan Rate Changes: Historical Dates of Changes and Rates available at *https://fred.stlouisfed.org/series/PRIME. See also* The EPA's Control Cost Manual, section 1, Chapter 2 titled ''Cost Estimation: Concepts and Methodology,'' at 16.

[176] A spreadsheet that documents Texas's cost analysis of scrubber upgrades was provided by the TCEQ to the EPA at our request during the State's public comment period on the proposed Texas RH SIP for the second planning period. However, this spreadsheet was not included in the proposed Texas RH SIP, nor in the final SIP submitted to the

Continued

Texas Regional Haze Plan merely provided an ''example'' which indicates that the average capital cost of wet scrubber upgrades is $37.84/kW and the average operating and maintenance cost is $3.09/kW-year for a 537 MW EGU.[177] The significance of the example provided in the 2021 Texas Regional Haze Plan is unclear. An examination of the total capital costs included in the 2021 Texas Regional Haze Plan reveals that Texas did not use an assumption of $37.84/kW to estimate capital costs of scrubber upgrades, and in fact used a cost assumption that was over three times higher than the referenced ''average'' value. To illustrate, Texas estimated the capital cost of scrubber upgrades at AEP Pirkey Unit 1 to be $99,921,030, as shown in table 9. This capital cost estimate is not the equivalent of $37.84/kW, but rather $138.59/kW. In examining the other scrubber upgrades, Texas applied the $138.59/kW to all scrubber upgrade estimates.[178] Thus, the example provided by Texas indicating that the average capital cost of wet scrubber upgrades is $37.84/kW is misleading and an inaccurate representation of Texas's methodology for estimating the capital cost of wet scrubber upgrades.[179]

Because Texas did not include adequate documentation of its cost analysis, the EPA requested additional supporting information and data from Texas regarding its technical analyses to aid in our review. In response to this request, the Texas provided additional files to the EPA, including Excel spreadsheets, that were not made available to the public during Texas's public comment period and were not included in the final SIP submitted to the EPA.[180] One of these files is an Excel spreadsheet that documents and provides additional information on Texas's methodology for estimating the capital costs and annual operating and maintenance costs of scrubber upgrades.[181] Reviewing the spreadsheet demonstrates Texas's cost methodology relied on certain cost assumptions based on outlier information.[182]

The files documenting the scrubber upgrades analysis confirm that Texas used an assumption of $139/kW to calculate the capital costs of scrubber upgrades. This $139/kW assumption is the highest capital cost $/kW value out of several scrubber upgrades cost estimates for EGUs compiled from a National Park Service (NPS) spreadsheet from 2010 found on the Western Regional Air Partnership (WRAP) legacy website and relied upon by Texas.[183] Furthermore, this $139/kW assumption is an outlier value, which corresponds to upgrades at the Coal Creek Power Plant in North Dakota.[184] The costs for upgrades at this facility included additional project elements other than upgrades to the existing scrubber, such as coal drying.[185] Texas did not explain why using cost assumptions from a project, which included additional coal pre-treatment project costs like coal drying, is appropriate or reasonable in estimating the capital costs of the scrubber upgrades it was considering. The next highest capital cost $/kW value included in the spreadsheet is an upgrade project that was estimated to cost $52.39/kW.[186] The average $/kW capital costs provided in the spreadsheet, even including the $139/kW outlier is approximately $38/kW, with costs as low as $4/kW for some units.[187] Scrubber upgrade costs are site-specific, depending on existing scrubber design and available upgrades.[188] Therefore, it is inappropriate to rely on cost assumptions that are based on outliers, especially absent any discussion of why the higher cost is more reflective of upgrades necessary at a particular source, because they are not representative of the anticipated cost of scrubber upgrades at these units. Had Texas instead relied on the average capital cost found in the spreadsheet, and presented as the example calculation in its SIP, the capital costs contained in the SIP would have been significantly lower.

To illustrate this point, the EPA recalculated the scrubber upgrade costs for Martin Lake, San Miguel, and Pirkey using the average capital cost[189] as well as the average operation and maintenance costs contained in Texas's Excel spreadsheet and identified in their example calculation in appendix B of the 2021 Texas Regional Haze Plan.[190] EPA focused on these three sources as these were the scrubber upgrades that Texas identified as meeting its cost-effectiveness threshold of $5,000/ton. These recalculated values are found in table 18.

EPA. Thus, the public did not have an opportunity to review or comment on the complete technical basis of Texas's cost analysis of scrubber upgrades. We discuss these deficiencies in Texas's cost analysis of scrubber upgrades in greater detail in the paragraphs that follow. This spreadsheet is included in the docket for this action (scrubber upgrades.xlsx).

[177] *See* 2021 Texas Regional Haze Plan, appendix B at B–13.

[178] The example provided by Texas for estimating annual operating and maintenance costs of scrubber upgrades is also misleading. For example, Texas's estimated annual operating and maintenance cost of scrubber upgrades for AEP Pirkey Unit 1 is $2,740,188, as shown in Table 9. This is the equivalent of $3.80/kW-year.

[179] The only other information Texas provides about its scrubber upgrade analysis is in appendix B of the 2021 Texas Regional Haze Plan. Specifically, Texas includes the following statement in discussing the scrubber upgrades analysis for AEP Pirkey Unit 1: The Western Regional Air Partnership (WRAP) data for potential scrubber upgrades and a WRAP spreadsheet from August 2010 containing data for EGUs with proposed Best Available Retrofit Technology SO_2 controls were relied on for information (also included in the docket for this action). The spreadsheet data indicated the greatest increase in scrubbing system efficiency an existing system could achieve, from baseline levels, was 95%. Therefore, the TCEQ evaluated a potential system upgrade from 79% to 95%. *See* 2021 Texas Regional Haze Plan, appendix B at B–4. However, it is unclear based on the 2021 Texas Regional Haze Plan itself whether the WRAP data and spreadsheet were in any way used to estimate the capital costs and annual operating and maintenance costs of wet scrubber upgrades. Furthermore, this statement was only included in Texas's discussion of the scrubber upgrades analysis for AEP Pirkey Unit 1 but not specifically mentioned in the discussion of scrubber upgrades for other EGUs.

[180] *See* ''scrubber upgrades.xlsx'' included in the docket for this action. *See also,* additional source specific cost spreadsheets from Texas available in the docket for this action.

[181] scrubber upgrades.xlsx.

[182] TCEQ also used the outlier value to estimate the cost of upgrading the scrubbers at the Holcim cement facility from 90% to 95% control efficiency. These costs are also likely an over estimation for the same reasons as explained later in this section.

[183] *See* ''scrubber upgrades.xlsx''; *see also* 2010 NPS EGUs With Proposed BART SO_2 Controls Spreadsheet available in the docket.

[184] 2010 NPS EGUs With Proposed BART SO_2 Controls Spreadsheet available in the docket.

[185] *See* Great River Energy Coal Creek BART Emission Control Cost Analysis. The report is available in the docket for this action.

[186] *See* ''scrubber upgrades.xlsx'' available in the docket for this action.

[187] *See* ''scrubber upgrades.xlsx'' available in the docket for this action.

[188] For example, costs to upgrade scrubber performance from 94–95% at San Miguel might only require increased reagent use, whereas scrubber upgrades at less efficient units may require more significant equipment upgrades or elimination of scrubber bypasses, as demonstrated by the range in costs in the NPS dataset.

[189] By providing this illustration, the EPA is not necessarily endorsing the use of the average capital cost to calculate the cost of scrubber upgrades at a source. Given the site-specific nature of scrubber upgrades, the use of the average capital cost of several scrubber upgrades may not accurately reflect the cost to upgrade any particular scrubber.

[190] *See* ''EPA modified RH–2021-Summary Emissions, Cost Table.xlsx'' and ''EPA modified-scrubber upgrades.xlsx'' spreadsheets. Available in the docket for this action.

TABLE 18—TCEQ VS. EPA RECALCULATED SCRUBBER UPGRADE COSTS

Company/site name	Unit	2018 EIA electric capacity/2016 EI capacity or engine rating	Capital costs		15 Year life total annual cost		Emissions removed (tpy)	15 year life cost effectiveness ($/ton)	
			TCEQ	Avg.	TCEQ	Avg.		TCEQ	Avg.
American Electric Power/ Pirkey Power Plant.	Unit 1	721 MW	$99,921,030	$27,279,969	$15,877,183	$5,817,383	3,874	$4,098	$1,502
NRG Energy/Limestone Elec. Gen. Station.	Unit 1	893 MW	123,757,947	33,787,812	19,664,805	7,205,163	3,212	6,123	2,244
	Unit 2	957 MW	132,627,498	36,209,335	21,074,153	7,721,546	3,259	6,467	2,370
Vistra Energy/Martin Lake Electrical Station.	Unit 1	793 MW	109,899,275	30,004,182	17,462,700	6,398,313	16,172	1,080	396
	Unit 2	793MW	109,899,275	30,004,182	17,462,700	6,398,313	14,101	1,238	454
	Unit 3	793MW	109,899,275	30,004,182	17,462,700	6,398,313	16,458	1,061	389
San Miguel Electric Cooperative/San Miguel Electric Plant.	Unit 1	410 MW	56,820,558	15,512,881	9,028,634	3,308,081	2,001	4,512	1,653

Based on this information, and utilizing Texas's selected 15-year remaining useful life assumption, the 15-year total annual costs for scrubber upgrades at these three facilities decrease from $77,293,916 to $28,320,403, a reduction in total annual costs of $48,973,513. If the outlier value was excluded in determining the average capital cost, the total annualized costs would be even lower. Thus, the reliance on this outlier value in estimating the capital costs significantly inflates the total annualized costs provided in the 2021 Texas Regional Haze Plan. Without an explanation as to why this was reasonable, this reliance is unjustified. Furthermore, had Texas used the average capital cost, the costs of upgrading the scrubbers at both units at Limestone would have been below its $5,000/ton cost-threshold. Based on Texas's analysis, upgrading the controls on both units at Limestone would result in a reduction in over 6,400[191] tpy of SO_2. The inflation of total annualized costs is also important, as discussed later in the notice, because Texas relies on the combined total annualized costs of control measures in part to determine that no additional measures are necessary to include in its long-term strategy to make reasonable progress.[192]

We are proposing to find that Texas's cost analysis of SO_2 scrubber upgrades for EGUs does not meet the requirements under 40 CFR 51.308(f)(2)(iii) to document the technical basis, including costs, that the State is relying on to determine the emission reduction measures that are necessary to make reasonable progress. Furthermore, in estimating the cost of scrubber upgrades as part of its four-factor analysis, many assumptions made by Texas were not adequately justified, and thus unreasonable, as it resulted in inflated and unreliable cost estimates. Because of these flaws, we find that Texas did not reasonably consider the cost of compliance as required by the RHR and CAA.[193]

c. Time Necessary for Compliance

In its 2021 Regional Haze Plan, despite the time necessary for compliance being one of the four statutory factors a State must consider when determining what control measures are necessary for reasonable progress,[194] Texas stated in its submission that the time necessary for compliance was not a critical factor in the determination of applicable additional controls for Texas sources.[195] That being said, Texas determined that the time necessary for a source to design, build, and install SO_2 scrubbing technology would be approximately three years and that the time necessary to build and commence operation of DSI technology could be less given that scrubbing vessels would not need to be constructed.[196] Texas also assumed that the time to design, build, and install NO_X control technologies would be approximately three years. While we are proposing to disapprove Texas's long-term strategy for the reasons provided elsewhere in Section IV.E of this notice, we note that Texas's assumptions of the time necessary for compliance for the controls evaluated are reasonable.

d. Energy and Non-Air Quality Environmental Impacts of Compliance

Where quantifiable for a particular control option, energy impacts of compliance are reflected in the cost estimate and were considered by Texas under the cost of compliance factor.[197] For instance, electricity costs necessary to operate fans, pumps, and other ancillary equipment as well as waste disposal costs were factored into the cost of compliance calculations for dry and wet scrubbers, DSI systems, SCR systems, and SNCR systems.[198] Texas stated that control systems that require only modifications to alter fuel-air mixing and combustion temperatures are not expected to have additional electricity or steam demands or to generate wastewater or solid waste.[199] For reasons explained throughout section IV.E we are proposing to disapprove Texas's long-term strategy.

e. Remaining Useful Life

As we have discussed in detail in section IV.E.2.b. of this proposed rule, we disagree with Texas's generalized assumption of a 15-year equipment life. Without additional discussion explaining why the EGUs and non-EGUs evaluated in the four-factor analysis could not be expected to operate more than 15 years or a federally enforceable commitment to cease operations or otherwise reduce emissions at these units within 15 years, Texas's generalized assumption of a 15-year equipment life is not reasonable and results in the overestimation of the annualized capital costs and the cost-effectiveness of controls.

f. Texas's Control Determinations

After characterizing the four statutory factors, States must consider and weigh the factors to determine what control measures are necessary to include in its long-term strategy to make reasonable progress.[200] In determining what control measures were necessary to make reasonable progress, Texas weighed the costs of compliance factor and projected visibility benefits of potential controls. Specifically, Texas relied on both the total annualized costs of controls in

[191] *See* 2021 Texas Regional Haze Plan, appendix B, at B–20.

[192] We provide additional discussion regarding the cost of scrubber upgrades in the TSD for this action, provided in the docket.

[193] *See* CAA 169(g)(1); 40 CFR 51.308(f)(2).

[194] *See* CAA 169A(g)(1); 40 CFR 51.308(f)(2)(i).

[195] 2021 Texas Regional Haze Plan at 7–13.

[196] 2021 Texas Regional Haze Plan at 7–13.

[197] 2021 Texas Regional Haze Plan at 7–13.

[198] 2021 Texas Regional Haze Plan at 7–13.

[199] 2021 Texas Regional Haze Plan at 7–14.

[200] *See* CAA 169A(g)(1); CAA 169A(B)(2)(b).

considering the costs of compliance, which it calculated was over $200 million, and the ''less than perceptible visibility benefit'' it projected in determining that no additional control measures were necessary to include in its long-term strategy to make reasonable progress.[201]

Texas derived the total annualized cost by adding together the annualized costs of controls at each source that met its $5,000/ton cost effectiveness threshold. Table 19 presents a summary of the estimated total annualized cost of the controls that met Texas's $5,000/ton threshold.[202]

TABLE 19[203]—TEXAS'S POTENTIAL CONTROL STRATEGY SUMMARY

Pollutant	Total emissions reductions (tons/yr)	Estimated total annualized cost
NO_X	3,171	$9,335,087
SO_2	79,285	195,539,404
Total Costs		204,874,491

In conjunction with total annualized costs, Texas also considered the potential visibility benefits of controls by conducting three different photochemical modeling sensitivity runs representing different control scenarios. Similar to how it calculated the total annualized costs, Texas only included those control measures at sources for which the cost of the control measures met the $5,000/ton threshold for NO_X or SO_2.[204] While Texas's 2021 Regional Haze Plan did not specifically identify (in Chapter 7 or Chapter 8 of its SIP) which sources or control measures were actually included in the sensitivity modeling, the information the TCEQ included in PowerPoint presentations used for consultation indicates control measures for 11 out of the 18 sources selected for evaluation under the four factor analysis were included in the sensitivity modeling.[205] Each sensitivity scenario reduced NO_X and/or SO_2 emissions at specific EGU and non-EGU sources for the modeled 2028 scenario.[206] Scenario 1 [207] involved the removal of emissions from the Oklaunion Power Station as its owners had announced its retirement in 2020. Scenario 2 [208] included SO_2 reductions at all units with identified cost-effective SO_2 controls in addition to Scenario 1. Scenario 3 [209] included NO_X reductions at all units with identified cost-effective NO_X controls in addition to Scenario 2. We note that the additional visibility improvements provided by the inclusion of NO_X controls in Scenario 3 provided little additional visibility benefit on the average across the 20 percent most impaired days, yet the associated costs of these controls resulted in several millions of dollars being included in the total annual costs Texas calculated in its 2021 Texas Regional Haze Plan.[210] The results of this modeling analysis were used to estimate the overall visibility benefit these controls would have on the 20 percent most impaired days at the Class I areas impacted by Texas's emissions. The projected visibility improvements at Class I areas impacted by Texas sources under Scenario 3 are presented in table 20.[211]

TABLE 20—TEXAS'S ESTIMATED HAZE INDEX IMPROVEMENTS FOR AFFECTED CLASS I AREAS[212]

Class I area	Haze index improvement (dv)
Big Bend	0.07
Caney Creek	0.56
Guadalupe Mountains	0.03
Salt Creek	0.07
Upper Buffalo	0.21
White Mountain	0.02
Wichita Mountains	0.23

Texas ultimately determined that any visibility benefit for each Class I area would be ''imperceptible.'' Thus, combining the ''imperceptible'' projected visibility benefit for each Class I area with the corresponding total annual costs associated with the controls included in the modeled control strategy, Texas concluded that no additional control measures were necessary to make reasonable progress. As discussed below, the EPA finds Texas's conclusion to be unjustified, unreasonable, and inconsistent with the CAA and the RHR.

i. Texas's Consideration of Costs To Support Its Determination That No Additional Measures Are Necessary To Make Reasonable Progress Was Unjustified and Unreasonable

Texas determined that the total annualized cost of controls of

[201] 2021 Texas Regional Haze Plan table 7–4 at 7–16 to 7–17.

[202] 2021 Texas Regional Haze Plan table 7–4 at 7–14.

[203] This table does not reflect NO_X costs and associated emission reductions from the Oklaunion facility. *See* 2021 Texas Regional Haze Plan at 7–15.

[204] 2021 Texas Regional Haze Plan at 7–14.

[205] 2021 Texas Regional Haze Plan, appendix A at 71–74 of 227. This appendix also provides a table that shows which units and control measures were included in its sensitivity modeling. While Texas's analysis found that certain control measures at Oklaunion Power Station were above its $5,000/ton threshold, Texas also included the shutdown of the facility in its sensitivity modeling rather than potential control measures. 2021 Texas Regional Haze Plan at 7–15.

[206] *See* 2021 Texas Regional Haze Plan, Section 8.5. More general information can be found in section 7.2.2.3.

[207] Texas refers to this Scenario as ZeroOKU.

[208] Texas refers to this Scenario as ZeroOKU&SO_2.

[209] Texas refers to this Scenario as ZeroOKU&SO_2&NO_X.

[210] *See* 2021 Texas Regional Haze Plan at 8–64.

[211] 2021 Texas Regional Haze Plan table 7–6 at 7–16.

[212] The visibility improvements presented in the table reflect Scenario 3.

approximately $205 million was too high, but provided no context or support as to why total annualized cost was an appropriate decision metric in consideration of the cost of compliance, what range of total annualized cost would be reasonable, and why $205 million was not reasonable. While the RHR does allow for the evaluation of sources on either a source-by-source basis or based on the evaluation of groups of sources, in almost any case, a State could, as Texas has here, aggregate the annualized control costs for a large number of sources such that the State could find the total cost to be ''too expensive;'' and therefore, determine that no additional controls are necessary to make reasonable progress. This is especially true in States like Texas given the vast number of sources in the State and the number of Class I areas impacted by the emissions from these sources. Thus, a reasonable source selection for a State like Texas would necessarily identify several sources for evaluation of potential control measures for which total annualized costs would end up being ''large.'' Therefore, it is unsurprising that Texas found that total annualized costs of controls were over $200 million; however, without a relative scale to compare against, this $200 million figure is meaningless and does not necessarily support Texas's determination that no control measures are necessary for inclusion in its long-term strategy to make reasonable progress. This concern is supported by EPA's 2019 Guidance which states that, ''EPA does not believe it is reasonable to solely use a threshold for the capital cost or annualized cost to determine that a measure is not necessary to make reasonable progress. Large capital costs considered in isolation may not provide complete information about the potential reasonableness of a measure . . .'' [213] Furthermore, if this approach were replicated in each successive planning period, no controls would ever be found to be cost-effective and necessary to make reasonable progress, which would result in no long-term strategy. Rather, all that can be determined from Texas's use of the total annualized cost is that it represents the sum total of the costs of controls for a group of sources that impact one or more Class I areas in Texas or nearby States. Therefore, Texas's use of total annualized cost was unjustified and unreasonable.

In addition to failing to justify how consideration of total annualized cost was reasonable, Texas also failed to explain and justify the apparent contradiction between considering controls to be cost effective on a source specific basis using a threshold of $5,000/ton, but then dismissing those same controls as too costly when presented as total annualized costs. The need to support and justify this apparent contradiction is critical considering that Texas selected its $5,000/ton cost effectiveness threshold to ''identif[y] the potential control measures for each source that could be applied in a cost-effective manner,'' [214] and thus eliminate those control measures which they deemed too costly. Texas's reliance on the total annual costs of all controls considered cannot outweigh or otherwise negate the fact these controls were all below Texas's selected cost-effectiveness threshold of $5,000/ton. Furthermore, we note that the controls that make up this total annualized cost have an average $/ton cost-effectiveness of less than $2,500/ton SO_2 reduced and less than $3,000/ton for NO_X reduced.

Additionally, while the EPA finds that Texas's use of total annualized costs was unjustified and unreasonable, even if such a metric were appropriate, Texas's total annualized cost of approximately $205 million included unreasonable costs associated with the scrubber upgrades it evaluated. As previously explained in section IV.E.2.b, Texas's calculation of the costs associated with upgrading the scrubbers at Martin Lake, Pirkey, and San Miguel used an unsupported outlier value in determining the costs, which resulted in an inflated cost estimation. Had Texas used the average costs rather than the outlier value, the total annualized cost of the scrubber upgrades would have decreased by approximately $49 million, and the total annualized cost of controls would have decreased from approximately $205 million to $156 million.[215] Thus, this one decision significantly and unreasonably inflates the total annualized cost. Even assuming the total annualized cost metric is a reasonable way of considering costs, because Texas failed to describe or justify why $205 million was too high, and what range of costs would be reasonable, we cannot determine whether Texas would have found this lower total annualized cost reasonable such that the measures are necessary for inclusion in its long-term strategy to make reasonable progress. Thus, the EPA finds that Texas failed to justify how its use of total annualized costs to dismiss controls was reasonable and consistent with the CAA and RHR requirement to include those measures necessary to make reasonable progress in its long-term strategy.

ii. Texas's Reliance on the Lack of Perceptible Visibility Benefits To Support Its Determination That No Additional Measures Are Necessary Was Unreasonable and Inconsistent With the CAA and the RHR

Texas's determination that visibility benefits are only meaningful if it results in a perceptible change in visibility was unjustified and unreasonable. As previously explained, after identifying which of the 18 sources selected for further analysis using the four statutory factors had potential control measures meeting the $5,000/ton cost-effectiveness threshold for NO_X or SO_2, those emission reductions associated with those control measures were then included in the photochemical modeling sensitivity runs conducted by the TCEQ. The projected visibility benefits are presented in table 20. Because the results of the modeling analysis showed that the visibility benefit of the modeled control strategy for each Class I area fell within a range that was ''imperceptible,'' (which Texas defines as less than 1.0 deciview), Texas found that this amount of visibility improvement was too small to support requiring any additional control measures for purposes of making reasonable progress during this planning period.

The CAA and RHR are clear that the four statutory factors must be considered when determining the enforceable emissions limitations, schedules of compliance, or other measures that are necessary for reasonable progress toward meeting the national goal.[216] As the EPA has previously explained, while visibility may be considered along with the four statutory factors, it must be done in a reasonable way.[217] For example, visibility modeling can be used to compare the visibility benefits of cost-effective controls selected through four-factor analysis to determine which controls produce the greatest visibility benefits compared to their costs, or prioritizing which among several sources should install controls during a planning period.[218] Nowhere in the statute or regulations is there a requirement that control measures produce perceptible visibility

[213] 2019 Guidance at 39.

[214] *See* 2021 Texas Regional Haze Plan at 7–14.

[215] See ''EPA modified-RH 2021-Summary Emissions, Cost Table.xlsx'' available in the docket for this action.

[216] *See* CAA 169A(g)(1); 40 CFR 51.308(f)(2).

[217] 2021 Clarifications Memo at 14; *see* 2019 Guidance at 36–37.

[218] 2021 Clarifications Memo at 12–13.

improvements to be considered necessary to make reasonable progress at a particular Class I area; therefore, consideration of visibility benefits cannot outweigh the results of the analysis based on the four factors explicitly prescribed in statute.[219] Furthermore, if a State uses a visibility benefit threshold to evaluate control measures, it must explain how its approach is consistent with the requirement to consider the statutory factors in making reasonable progress determinations. Texas did not explain how the use of perceptibility as a threshold to assess visibility benefits is consistent with the requirement to make reasonable progress.

Section 169A(a) 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 which impairment results from manmade air pollution.'' Nowhere in the CAA or the RHR is there a requirement to make a minimum amount of visibility improvement in determining that potential control measures are necessary to make reasonable progress. Rather, States are to make ''reasonable progress'' towards natural visibility conditions every planning period. What is necessary for reasonable progress, as described throughout this section and this notice, is determined by a consideration of the four statutory factors. To that end, the EPA has reiterated that visibility thresholds used for BART and other analyses in the first planning period (*e.g.,* 0.5 deciviews or 1 dv) are, in most cases, not appropriate thresholds for evaluating the impact of controls for reasonable progress in the second planning period and beyond.[220] This is because regional haze is visibility impairment that is caused by the emission of air pollutants from numerous anthropogenic sources located over a wide geographic area.[221] At any given Class I area, hundreds or even thousands of individual sources may contribute to regional haze.[222] This necessarily means that to meet Congress's goal of preventing any future, and addressing any existing impairment, States must address these numerous sources of manmade air pollution which cause visibility impairment at Class I areas. Given the iterative nature of the regional haze program, evaluation of control measures for relatively smaller sources (with commensurate smaller visibility benefits) will be needed to continue making reasonable progress towards the national goal. As such, states should consider the magnitude of modeled visibility impacts or benefits in the context of its own contribution to visibility impairment. That is, whether a particular visibility impact or change is ''meaningful'' should be assessed in the context of the individual state's contribution to visibility impairment. At several Class I areas that Texas evaluated in its 2021 Regional Haze Plan, sulfate was the largest cause of anthropogenic visibility impairment, with the largest contribution coming from Texas anthropogenic sources.[223] Texas's own modeling also showed that, for multiple Class I areas, relative to the home State in which the Class I area is located, Texas's contribution to sulfate concentrations at the Class I area was more than the home State itself. For example, Texas's sulfate contribution at Caney Creek is nine times the amount of Arkansas's contribution (Texas anthropogenic contribution to particulate sulfate is 40.81 percent compared to Arkansas's anthropogenic contribution of 4.4 percent).[224] [225] At Wichita Mountains, Texas's sulfate contribution is over four times Oklahoma's contribution.[226] Yet, by using a threshold of perceptibility, Texas found that despite these impacts, the visibility benefits were too small to warrant requiring any additional control measures to make progress towards reducing this contribution. Such an approach is unreasonable as the approach results in maintaining significant visibility impairment in contradiction to Congress's expressly stated goal of remedying manmade impairment.[227] This concern in part is why the EPA has explained that ''the existence of an impact above a perceptibility threshold is not a statutory or regulatory factor to be used when determining whether a source or sources contribute to visibility impairment or when determining measures needed for reasonable progress.'' [228] Thus, Texas's determination that the lack of perceptible visibility benefits weighed in favor of its determination that no additional measures were necessary was unreasonable and failed to result in a long-term strategy that encompassed all of the measures necessary to make reasonable progress in the second planning period.

Contrary to Texas's own conclusions, the EPA finds that the modeled TCEQ control scenarios *are* projected to achieve meaningful reductions in impairment. In table 21, based on Texas's own modeling and considering visibility impairment using light extinction units, the control scenarios provide for meaningful progress in reducing visibility impairment, particularly at Caney Creek. Considering just US anthropogenic impairment in 2028, Texas is responsible for 43 percent of the total U.S. anthropogenic impairment on the 20 percent most impaired days at Caney Creek. The modeled 3.18 Mm-1 reduction in impairment under Texas's Scenario 2 represents a 10.6 percent reduction of the total US anthropogenic impairment in 2028 and 25 percent reduction of the Texas contribution to anthropogenic impairment. In consideration of the statutory goal to remedy ''*any* existing impairment of visibility in mandatory Class I Federal area which impairment results from manmade air pollution,'' [229] it is not reasonable to dismiss a potential 10.6 percent reduction in the nationwide total anthropogenic impairment and a 25 percent reduction in the Texas contribution to impairment as insignificant, especially since Texas found all of the modeled controls to be below their chosen cost-effectiveness threshold of $5,000/ton.

[219] *See* CAA 169A(g)(1).

[220] Responses to Comments on Protection of Visibility: Amendments to Requirements for State Plans, at pg. 268; Final Rule 82 FR 3078 (Jan. 10, 2017). The document is available in the following docket EPA–HQ–OAR–2015–0531; 2019 Guidance, at pg. 38–39.

[221] 40 CFR 51.301.

[222] 82 FR 3078, 3093 (Jan. 10, 2017).

[223] *See* 2021 Texas Regional Haze Plan, appendix F, section 1.2.4.

[224] 2021 Texas Regional Haze Plan at 8–52 (''The results indicate that for the 13 Class I areas evaluated outside of Texas, the Texas influence for particulate sulfate is greater than the CIA home state influence for nine of the areas, with the largest influence ratio for Caney Creek in Arkansas, at 9.27, as highlighted in yellow in table 8–41. The Texas influence on particulate nitrate is larger for six sites, with a maximum ratio of 3.45 for Carlsbad Caverns in New Mexico, as highlighted in pink. Six sites have a larger Texas influence for both particulate sulfate and nitrate: Carlsbad Caverns, Bosque del Apache, Salt Creek, and White Mountain in New Mexico; and Caney Creek and Upper Buffalo in Arkansas.'').

[225] 2021 Texas Regional Haze Plan, appendix F, Figure 1–74 at F–75.

[226] 2021 Texas Regional Haze Plan table 8–41 at 8–53.

[227] *See* CAA 169A(a)(1).

[228] Responses to Comments on Protection of Visibility: Amendments to Requirements for State Plans, at 268; Final Rule 82 FR 3078 (Jan. 10, 2017). The document is available in the following docket EPA–HQ–OAR–2015–0531.

[229] 42 U.S.C. 7491(a)(1) (emphasis added).

TABLE 21 [230]—VISIBILITY BENEFIT OF TEXAS'S CONTROL SCENARIO 2

Class I area	IMPROVE monitor	2028 extinction (Mm-1)	Texas anthro (%)	Non-Texas U.S. anthro (%)	Total US anthro (Mm-1)	Total anthro from Texas (Mm-1)	Texas % of total US anthropogenic impairment	Scenario 2 extinction reduction (Mm-1)	Scenario 2 reduction of total US anthropogenic (%)	Scenario 2 reduction of Texas anthropogenic contribution (%)	Scenario 2 extinction reduction (dv)	Scenario 2 extinction reduction compared to Natural conditions (dv)
Caney Creek ...	CACR1	55.4	23	31	29.92	12.74	43	−3.18	*−10.60*	*−25.00*	−0.56	−1.32
Big Bend	BIBE1	41.2	10	5	6.18	4.12	67	−0.31	*−5.00*	*−7.50*	−0.07	−0.18
Upper Buffalo ..	UPBU1	53.4	13	38	27.23	6.94	25	−1.2	*−4.40*	*−17.30*	−0.21	−0.48
Wichita Mountains.	WIMO1	53.2	18	33	27.13	9.58	35	−1.19	*−4.40*	*−12.40*	−0.22	−0.61
Hercules-Glades.	HEGL1	57.2	9	48	32.60	5.15	16	−0.78	*−2.40*	*−15.20*	−0.13	−0.31
Salt Creek	SACR1	40.3	12	34	18.54	4.84	26	−0.27	−1.50	−5.60	−0.06	−0.16
Guadalupe Mountains.	GUMO1	34	11	11	7.48	3.74	50	−0.1	−1.30	−2.70	−0.03	−0.06

Texas's consideration of visibility benefit is also unreasonable because Texas only considered the potential visibility benefits relative to ''dirty background'' conditions. Because estimates of the visibility benefits of emission control measures help guide regulatory decisions, relying solely on a quantification of visibility benefits relative to ''dirty background'' [231] as Texas did in its 2021 Regional Haze Plan (*i.e.,* conditions with greater impairment than natural background visibility conditions) obscures the full potential benefits of control measures and makes it less likely that a measure, or measures, would appear reasonable from a visibility benefit perspective.[232] Thus, this approach to considering visibility benefit serves to *maintain* the current impairment at Class I areas, which is inconsistent with the statutory goal of the CAA § 169A(a)(1) to eliminate future, and remedy existing manmade visibility impairment. Texas's own modeling results show that had Texas considered the visibility improvement associated with the control scenarios it modeled relative to natural background, the visibility improvement would have been considerably larger. For example, under control Scenario 2, the visibility improvement at Caney Creek would be considerably larger (1.32 deciviews) than the values documented by Texas (0.56 deciview).[233] The right most column in table 21 shows Texas's modeled visibility benefits calculated relative to natural visibility conditions. Because Texas's consideration of projected visibility benefits was limited to a dirty background basis and did not consider the full potential benefits associated with each control scenario it evaluated, Texas's determination that the visibility benefits did not support requiring any additional control measures was unreasonable.

Recent annual emissions data from EPA's Clean Air Markets Program Data also contradict Texas's conclusion that no controls are needed due to the lack of perceptible visibility improvement. Across all states, Texas EGU SO_2 emissions ranked 1st and has ranked 1st over the past several years.[234] Within the group of sources analyzed by Texas, Martin Lake and Coleto Creek ranked 6th and 31st, respectively, in facility-wide SO_2 emissions across the United States.[235] The magnitude of SO_2 emissions from the sources Texas included in its sensitivity run, as well as all of Texas's EGUs statewide, is demonstrated in the model results showing Texas's large contribution to the total U.S anthropogenic visibility impairment. This, combined with the outcome of the four-factor analyses, emphasize that emission reductions from additional SO_2 controls on the sources Texas considered are cost-effective would result in meaningful progress towards remedying visibility impairment from manmade pollution at impacted Class I areas.

Therefore, the EPA finds that Texas's use of perceptibility as a visibility threshold to support its decision to dismiss controls was unreasonable, resulted in an unjustified long-term strategy for the second planning period, and is inconsistent with the CAA and the RHR.

g. EPA's Conclusions and Proposed Action on Texas's Four Factor Analysis

As explained in the preceding sections, due to numerous flaws in its evaluation of the four-factors and the resulting control determinations, Texas failed to submit to the EPA a long-term strategy that includes ''the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress'' as required by 40 CFR 51.308(f)(2).[236] Consequently, the EPA is proposing to find that the 2021 Texas Regional Haze Plan does not satisfy the requirements of 40 CFR 51.308(f)(2).

3. Additional Long-Term Strategy Requirements

Aside from the long-term strategy requirements already discussed, States must also meet the requirements specified in 40 CFR 51.308(f)(2)(ii)-(iv) when developing their long-term strategies for the second planning period. Under 40 CFR 51.308(f)(2)(ii) states are required to consult with other states that have emissions that are

[230] See ''EPA TX contributions to Class I areas.xlsx'' available in the docket for this action.

[231] *North Dakota* v. *EPA,* 730 F.3d 750, 764–766 (8th Cir. 2013) (''Although the State was free to employ its own visibility model and to consider visibility improvement in its reasonable progress determinations, it was not free to do so in a manner that was inconsistent with the CAA. Because the goal of § 169A is to attain natural visibility conditions in mandatory Class I Federal areas, see 42 U.S.C. 7491(a)(1), and EPA has demonstrated that the visibility model used by the State would serve instead to maintain current degraded conditions, we cannot say that EPA acted in a manner that was arbitrary, capricious, or an abuse of discretion by disapproving the State's reasonable progress determination based upon its cumulative source visibility modeling.'').

[232] *See* 2019 Guidance at 16, 36.

[233] Because improvement in visibility is a non-linear function of light extinction, focusing on visibility improvement in delta deciviews can mask the actual progress that can be made in reducing impairment by the implementation of controls unless visibility improvement is measured against clean background conditions. See the TSD in the docket for this action for additional discussion of background conditions and visibility modeling.

[234] See ''SO_2 annual emissions by state 2016–2022.xlsx'' spreadsheet available in the docket for this action and available on EPA's CAMPD website, *https://campd.epa.gov/data/custom-data-download.*

[235] See ''Texas annual emissions by facility 2022.xlsx'' spreadsheet available in the docket for this action, and available on EPA's CAMPD website *https://campd.epa.gov/data/custom-data-download.*

[236] *See also* CAA 169A(b)(2).

reasonably anticipated to contribute to visibility impairment in Class I areas to develop coordinated emission management strategies. Texas included documentation of its consultation with other states and the FLMs in appendix A of its 2021 Regional Haze Plan.

In addition to our analysis on Section 51.308(f)(2)(iii) above, this section also requires that the emissions information considered to determine the measures that are necessary to make reasonable progress include information on emissions for the most recent year for which the State has submitted triennial emissions data to the EPA (or a more recent year), with a 12-month exemption period for newly submitted data. Texas's 2021 Texas Regional Haze Plan included 2011, 2014, and 2017 statewide NEI emission data for NO_X, SO_2, PM, VOCs, and NH_3. For the base case CAMx modeling, Texas also relied on 2018 emissions from EPA's AMPD, and 2016 emissions data reported to the State of Texas Air Reporting System (STARS) database for non-EGU sources.

Finally, in developing their long-term strategies, States must consider five additional factors specified under 40 CFR 51.308(f)(2)(iv). The five additional factors are: emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment; measures to mitigate the impacts of construction activities; source retirement and replacement schedules; basic smoke management practices for prescribed fire used for agricultural and wildland vegetation management purposes and smoke management programs; and the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. Chapter 7 of Texas's 2021 Regional Haze Plan includes a description of these additional factors.

Regardless, as explained in preceding sections, due to flaws and omissions in its source selection, four-factor analyses, and the resulting control determinations, we find that Texas failed to reasonably ''evaluate and determine the emission reduction measures that are necessary to make reasonable progress'' by considering the four statutory factors as required by CAA section 169A(b)(2)(A), CAA section 169A(g)(1), and 40 CFR 51.308(f)(2)(i). We also find that Texas failed to adequately document the technical basis that it relied upon in evaluating potential emissions reduction measures, as required by 40 CFR 51.308(f)(2)(iii). In so doing, the EPA finds that Texas failed to submit to the EPA a long-term strategy that includes ''the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress'' as required by 40 CFR 51.308(f)(2). Consequently, the EPA finds that the Texas's 2021 Regional Haze Plan does not satisfy the long-term strategy requirements of 40 CFR 51.308(f)(2). Therefore, we are proposing to disapprove these corresponding portions of Texas's SIP submission.

F. Reasonable Progress Goals

Section 51.308(f)(3) contains the requirements pertaining to RPGs for each Class I area. Texas is host to two Class I areas and is therefore subject to § 51.308(f)(3)(i) and, if appliable, to (ii). Section 51.308(f)(3)(i) requires a State in which a Class I area is located to establish RPGs—one each for the most impaired and clearest days—reflecting the visibility conditions that will be achieved at the end of the implementation period as a result of the emission limitations, compliance schedules and other measures required under paragraph (f)(2) to be in states' long-term strategies, as well as implementation of other CAA requirements. The long-term strategies as reflected by the RPGs must provide for an improvement in visibility on the most impaired days relative to the baseline period and ensure no degradation on the clearest days relative to the baseline period. Section 51.308(f)(3)(ii) applies in circumstances in which a Class I area's RPG for the most impaired days represents a slower rate of visibility improvement than the uniform rate of progress calculated under 40 CFR 51.308(f)(1)(vi). Under § 51.308(f)(3)(ii)(A), if the State in which a mandatory Class I area is located establishes an RPG for the most impaired days that provides for a slower rate of visibility improvement than the URP, the State must demonstrate that there are no additional emission reduction measures for anthropogenic sources or groups of sources in the State that would be reasonable to include in its long-term strategy. Section 51.308(f)(3)(ii)(B) requires that if a State contains sources that are reasonably anticipated to contribute to visibility impairment in a Class I area in *another* State, and the RPG for the most impaired days in that Class I area is above the URP, the upwind State must provide the same demonstration.

Texas established RPGs based on projected visibility improvements from emission reductions associated with the Federal CAA, the Texas Clean Air Act, Texas' ozone SIP revisions and rules, and agreements between the EPA and petrochemical refineries and carbon black manufacturing plants for nitrogen oxides (NO_X) and sulfur dioxide (SO_2) emissions reductions. As part of establishing the RPGs, the TCEQ evaluated the impact of emissions reductions from these adopted measures on visibility in Class I areas using photochemical modeling. Further, the TCEQ evaluated the impacts of additional controls beyond those already adopted using photochemical modeling in a sensitivity analysis. Based on the results of Texas's four-factor analysis and the sensitivity analysis, the TCEQ concluded that additional measures for visibility improvement at Texas Class I areas and Class I areas affected by Texas emissions are not reasonable for this planning period.

The TCEQ elected to perform CAMx modeling to develop its future year visibility projections to establish its reasonable progress goals and evaluate the impact of identified emissions reductions on visibility in Class I areas. The CAMx modeling was based on the EPA's Modeling Guidance and consistent with the modeling protocol included in appendix G of its SIP (Modeling Protocol). The photochemical modeling used to support the 2021 Texas Regional Haze Plan consisted of base case model runs, future year model runs, including source apportionment runs, and three sensitivity runs.[237] The TCEQ describes the development of its emission inventories for use in each modeling scenario in appendix E of its SIP (Emissions Modeling).

The TCEQ elected to use the adjusted Uniform Rate of Progress (URP) in its 2021 Regional Haze Plan SIP to evaluate its reasonable progress goals. The TCEQ presents the visibility for Class I areas on the 20% clearest days and 20% most impaired days for the 2014–2017 period, 2028 projected future year, and the 2028 adjusted glidepath and are shown in table 8–43 of its SIP and presented here in table 22.

[237] 2021 Texas Regional Haze Plan at 8–2.

TABLE 22—VISIBILITY FOR CLASS I AREAS ON 20% MOST IMPAIRED DAYS AND 20% CLEAREST DAYS

Class I area (IMPROVE ID, state)	2014-2017 20% clearest days (dv)	Future year (2028) 20% clearest days (dv)	2028 adjusted glidepath (dv)	Future year (2028) 20% most impaired days (dv)
Big Bend National Park (N.P.) (BIBE, TX)	5.2	4.9	14.4	14.2
Bosque del Apache Wilderness Area (W.A.) (BOAP, NM)	4.6	4.2	9.9	9.6
Breton Island W.A. (BRIS, LA)	11.8	11.3	19.8	18.3
Caney Creek W.A. (CACR, AR)	8.2	7.8	18.8	17.1
Great Sand Dunes W.A. (GRSA, CO)	2.9	2.6	8.2	7.3
Guadalupe Mountains N.P. (GUMO, TX)	4.5	4.1	12.8	12.2
Hercules-Glades W.A. (HEGL, MO)	9.8	9.1	19.6	17.4
Mingo W.A. (MING, MO)	11.2	10.6	20.2	18.6
Rocky Mountain N.P. (ROMO, CO)	1.3	1.1	9.2	7.3
Salt Creek W.A. (SACR, NM)	6.7	6.2	13.5	13.9
Upper Buffalo W.A. (UPBU, AR)	8.4	7.9	19.2	16.7
White Mountain W.A. (WHIT, NM)	2.6	2.2	10	9.5
Wheeler Peak W.A. (WHPE, NM)	0.3	0.1	6.5	5.3
Wichita Mountains W.A. (WIMO, OK)	8.4	7.7	17.4	16.7

Source: Texas 2021 Regional Haze SIP, Table 8–43.

Texas included baseline haze indices for Big Bend and Guadalupe Mountains in Chapter 8 of its 2021 Regional Haze Plan. Baseline visibility for the Big Bend Class I area is 5.78 dv for the 20% clearest days and 15.57 dv for the 20% most impaired days. Baseline visibility for the Guadalupe Mountains Class I area is 5.92 dv for the 20% clearest days and 14.60 dv for the 20% most impaired days. As Texas notes in its 2021 Texas Regional Haze Plan, and as shown in the data presented in table 22, the RPGs Texas established for both Big Bend and Guadalupe Mountains are below the adjusted glidepath.

Texas emissions impact visibility at one Class I area, Salt Creek Wilderness Area, in New Mexico, that is projected to be above the glidepath. Section 51.308(f)(3)(ii) requires states to demonstrate for Class I areas with a 2028 reasonable progress goal for the 20% most impaired days above the 2028 URP that there are no additional emission reduction measures for sources in the State that would be reasonable to include in the long-term strategy. The TCEQ states in its 2021 Texas Regional Haze Plan that the New Mexico Environment Department had not yet established a reasonable progress goal for Salt Creek Wilderness Area or developed its long-term strategy at the time Texas prepared its SIP; however Texas states that its analysis in the long-term strategy is robust, in accordance with 40 CFR 51.308(f)(3)(ii), and that it has provided a thorough evaluation of the Texas sources that impact Class I areas in and around Texas and consideration of whether any additional emission reduction measures are reasonable for the second planning period.[238]

As previously discussed in Section IV.E.1, using its source selection methodology, Texas did not select any sources of SO_2 for further evaluation at Salt Creek, despite Texas's PSAT modeling showing that Texas sources are responsible for almost three times the amount of influence due to particulate sulfate and more than one and half times the influence due to particulate nitrate as the home State of New Mexico.[239] Focusing on modeled U.S. anthropogenic impacts alone, Texas anthropogenic sources account for approximately 51.3% of the particulate sulfate concentrations at Salt Creek, with more than half of the Texas anthropogenic contribution coming from Texas EGUs.[240] Furthermore, the sensitivity modeling Texas conducted showed that potential SO_2 and NO_X reductions from the aggregate group of control measures considered would provide for an estimated 0.07 dv improvement in visibility at Salt Creek. This is despite the fact that only a few of the NO_X sources included in the sensitivity analyses were included based on their impact to Salt Creek and no SO_2 sources were selected based on their impact at Salt Creek. The 0.07 dv improvement is calculated from a reduction in extinction of 0.27 Mm^{-1} and represents a 1.5 percent reduction of total U.S. anthropogenic contribution and a 5.6 percent reduction of Texas's total anthropogenic contribution to visibility impairment at Salt Creek. While New Mexico had not established an RPG for Salt Creek at the time Texas submitted its SIP, contrary to its assertion, Texas's analysis did not meet the requirements of 51.308(f)(3)(ii)(B) to conduct a robust analysis with respect to Salt Creek as evidenced by the fact Texas did not evaluate sources of SO_2 despite PSAT modeling showing the substantial impact on the area from Texas.

Under 40 CFR 51.308(f)(3)(iv), the EPA must evaluate the demonstrations the State developed pursuant to 40 CFR 51.308(f)(2) to determine whether the State's reasonable progress goals for visibility improvement provide for reasonable progress towards natural visibility conditions. As previously explained in section IV.E., we are proposing to disapprove Texas's long-term strategy for failing to meet the requirements of 40 CFR 51.308(f)(2). Therefore, we also propose to disapprove Texas's reasonable progress goals under 40 CFR 51.308(f)(3) because compliance with that requirement is dependent on compliance with 40 CFR 51.308(f)(2).

G. Reasonably Attributable Visibility Impairment (RAVI)

The RHR contains a requirement at § 51.308(f)(4) related to any additional monitoring that may be needed to address visibility impairment in Class I areas from a single source or a small group of sources. This is called ''reasonably attributable visibility impairment,'' [241] also known as RAVI.

[238] 2021 Texas Regional Haze Plan at 8–59 to 8–60.

[239] 2021 Texas Regional Haze Plan at 8–52 and table 8–41 at 8–53.

[240] *See* 2021 Texas Regional Haze Plan, appendix F at F–63.

[241] The EPA's visibility protection regulations define ''reasonably attributable visibility

Continued

Under this provision, if the EPA or the FLM of an affected Class I area has advised a State that additional monitoring is needed to assess RAVI, the State must include in its SIP revision for the second implementation period an appropriate strategy for evaluating such impairment. The EPA has not advised Texas to that effect, and the FLMs for the Class I areas that Texas contributes to have not identified any RAVI from Texas sources.[242] For this reason, the EPA proposes to approve the portions of Texas's 2021 Regional Haze Plan relating to 40 CFR 51.308(f)(4).

H. Monitoring Strategy and Other Implementation Plan Requirements

Section 51.308(f)(6) specifies that each comprehensive revision of a state's regional haze SIP must contain or provide for certain elements, including monitoring strategies, emissions inventories, and any reporting, recordkeeping and other measures needed to assess and report on visibility. A main requirement of this subsection is for states with Class I areas to submit monitoring strategies for measuring, characterizing, and reporting on visibility impairment. Compliance with this requirement may be met through participation in the Interagency Monitoring of Protected Visual Environments (IMPROVE) network.

Texas discusses its monitoring strategy in Chapter 5 of its 2021 Regional Haze Plan. Haze species in Texas are measured and analyzed via the Interagency Monitoring of Protected Visual Environments (IMPROVE) network.[243] Table 23 of this preamble lists the IMPROVE stations representing visibility at Texas Class I areas. Due to the close proximity of the Class I areas, Carlsbad Caverns (New Mexico) and Guadalupe Mountains (Texas) share the same IMPROVE monitor.

TABLE 23—IMPROVE STATIONS AT FEDERAL CLASS I AREAS IN TEXAS

Monitor ID	Class I area	Sponsor	Years operated
BIBE1	Big Bend National Park	National Parks Service	1988–Present.
GUMO1	Guadalupe Mountains National Park	National Parks Service	1988–Present.

Section 51.308(f)(6)(i) requires SIPs to provide for the establishment of any additional monitoring sites or equipment needed to assess whether reasonable progress goals to address regional haze for all mandatory Class I Federal areas within the State are being achieved.

The IMPROVE program reviewed its aerosol monitoring sites in 2006 to set priorities for maintaining the sites in the event of federal budget cuts affecting the IMPROVE program.[244] This review determined that the IMPROVE aerosol samplers at Texas's two Class I areas represent conditions different from the conditions at the nearest Class I area IMPROVE monitors. Texas's two Class I IMPROVE monitors are not candidates for discontinuation since other IMPROVE monitors cannot represent conditions at Big Bend or Guadalupe Mountains.

Section 51.308(f)(6)(ii) requires SIPs to provide for procedures by which monitoring data and other information are used in determining the contribution of emissions from within the State to regional haze visibility impairment at mandatory Class I Federal areas both within and outside the State. In its 2021 Texas Regional Haze Plan, Texas stated that future assessments of visibility impairment and progress in reducing visibility impairment at Texas's two Class I areas, and at Class I areas in other states that Texas's emissions may potentially affect, will use the revised IMPROVE algorithm and will use data as prescribed in the EPA's Regional Haze Rule (40 CFR part 51, subpart P—Visibility Protection). The assessment will follow, as appropriate, the EPA's guidance including the 2019 Guidance and the 2018 Visibility Tracking Guidance.

Section 51.308(f)(6)(iii) does not apply to Texas, as it has a Class I area.

Section 51.308(f)(6)(iv) requires the SIP to provide for the reporting of all visibility monitoring data to the Administrator at least annually for each Class I area in the State. As noted above, the monitoring strategy for Texas relies upon the continued availability of the IMPROVE network. The TCEQ does not directly collect or handle IMPROVE data. The TCEQ will continue to participate in the IMPROVE Visibility Information Exchange Web System (VIEWS). The TCEQ considers VIEWS to be a core part of the overall IMPROVE program. The TCEQ will report IMPROVE data from the two Class I areas in Texas to the EPA using the VIEWS web system.

If Texas collects any visibility monitoring data through the state's air quality monitoring networks, the TCEQ will report those data to the EPA as specified under the Performance Partnership Grant agreement negotiated with the EPA Region 6. All validated data and data analysis results from any TCEQ visibility-related special studies are public information. The TCEQ will continue its practice of sharing the data and information with the EPA. Texas supports the continued operation of the IMPROVE network through both State and Federal funding mechanisms.

Section 51.308(f)(6)(v) requires SIPs to provide for a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment, including emissions for the most recent year for which data are available and estimates of future projected emissions. It also requires a commitment to update the inventory periodically. Texas provides for emissions inventories and estimates for future projected emissions by participating in the CenSARA RPO and complying with the EPA's Air Emissions Reporting Rule (AERR). In 40 CFR part 51, subpart A, the AERR requires states to submit updated emissions inventories for criteria pollutants to the EPA's Emissions Inventory System (EIS) every three years. The emission inventory data is used to develop the NEI, which provides for, among other things, a triennial state-wide inventory of pollutants that are reasonably anticipated to cause or contribute to visibility impairment.

Chapter 6 of the 2021 Texas Regional Haze Plan includes a discussion of the NEI data, and Section 8.3 details specific emission inventories and emissions inputs developed for the regional haze photochemical modeling

impairment'' as ''visibility impairment that is caused by the emission of air pollutants from one, or a small number of sources.'' 40 CFR 51.301.

[242] 2021 Texas Regional Haze Plan at 7–17.

[243] *See* 2021 Texas Regional Haze Plan, Chapter 5 for more information about Texas's monitoring strategy.

[244] Spatial and Seasonal Patterns and Temporal Variability of Haze and its Constituents in the United States Report IV: November 2006 available at *https://vista.cira.colostate.edu/Improve/spatial-and-seasonal-patterns-and-temporal-variability-of-haze-and-its-constituents-in-the-united-states-report-iv-november-2006/*.

conducted by the TCEQ. The source categories of the emissions inventories included are: (1) point sources, (2) area sources, (3) non-road mobile sources, (4) drilling rigs, (5) commercial marine vessels and locomotives, (6) airports and (7) on-road mobile sources. Statewide pollutant summaries by source category for the years 2011, 2014, and 2017 are provided in tables 6–1, 6–2, and 6–3 of Texas 2021 Regional Haze Plan. Summaries are for the following pollutants: SO_2, NO_X, PM_{10}, $PM_{2.5}$, VOCs, CO, and NH_3. Texas also provided a summary of anthropogenic SO_2 and NO_X emissions for each source type for 2011, 2014, and 2017 and are presented in tables 6–4 and 6–5 of the 2021 Texas Regional Haze Plan.

Section 51.308(f)(6)(v) also requires states to include estimates of future projected emissions and include a commitment to update the inventory periodically. Texas estimated 2028 future year emissions by applying growth projections and accounting for known existing federal, State, and local controls. The development of Texas's 2028 modeling emissions for the 2021 Texas Regional Haze Plan includes some methods used in previous SIP modeling for ozone, such as the Federal Tier 3 Vehicle Emission and Fuel Standards program, the Mass Emissions Cap-and-Trade (MECT) Program in the Houston-Galveston-Brazoria area, the Highly Reactive VOC Emission Cap-and-Trade (HECT) Program in Harris County, the Midlothian Cement Kiln caps and related agreed orders in the Dallas-Fort Worth area, and the EPA's final Cross-State Air Pollution Rule (CSAPR) update. Summaries of the primary data sources for the development of the future case modeling emissions are provided in the 2021 Texas Regional Haze Plan, appendix E, table 1–4: Summary of Future Case Point Source Emission Data Sources, table 1–5: Summary of Future Case On-Road Mobile Source Emission Data Sources, and table 1–6: Summary of Future Case Non-Road Mobile, Off-Road, Area, Oil-and-Gas, and Biogenic Source Emission Data Sources. The gridded photochemical modeling input files for the 2016 and 2028 emissions were provided along with the full emission processing message log files during Texas's public comment period. For point sources, Texas evaluated large stationary sources of emissions, such as electric generating units (EGUs), smelters, industrial boilers, petroleum refineries, and manufacturing facilities. Point source emissions were developed for the January 1 through December 31, 2016, annual episode with a 2028 future year projection. The data sources for development of the point source modeling emissions are summarized in the 2021 Texas Regional Haze Plan, appendix E, table 2–1: Sources of Point Source Emissions Data.

The EPA proposes to find that Texas has met the requirements of 40 CFR 51.308(f)(6) as described above, including its continued participation in the IMPROVE network and the CenSARA RPO and its on-going compliance with the AERR, and that no further elements are necessary at this time for Texas to assess and report on visibility pursuant to 40 CFR 51.308(f)(6)(vi).

In sum, for all the reasons discussed in this section, the EPA is proposing to approve Texas's 2021 Regional Haze Plan as meeting the requirements of 40 CFR 51.308(f)(6).

I. Requirements for Periodic Reports Describing Progress Towards the Reasonable Progress Goals

Section 51.308(f)(5) requires that periodic comprehensive revisions of states' regional haze plans also address the progress report requirements of 40 CFR 51.308(g)(1) through (5). The purpose of these requirements is to evaluate progress towards the applicable RPGs for each Class I area within the State and each Class I area outside the State that may be affected by emissions from within that State. Sections 51.308(g)(1) and (2) apply to all states and require a description of the status of implementation of all measures included in a state's first implementation period regional haze plan and a summary of the emission reductions achieved through implementation of those measures. Section 51.308(g)(3) applies only to states with Class I areas within their borders and requires such states to assess current visibility conditions, changes in visibility relative to baseline (2000–2004) visibility conditions, and changes in visibility conditions relative to the period addressed in the first implementation period progress report. Section 51.308(g)(4) applies to all states and requires an analysis tracking changes in emissions of pollutants contributing to visibility impairment from all sources and sectors since the period addressed by the first implementation period progress report. This provision further specifies the year or years through which the analysis must extend depending on the type of source and the platform through which its emission information is reported. Finally, § 51.308(g)(5), which also applies to all states, requires an assessment of any significant changes in anthropogenic emissions within or outside the State have occurred since the period addressed by the first implementation period progress report, including whether such changes were anticipated and whether they have limited or impeded expected progress towards reducing emissions and improving visibility.

The 2021 Texas Regional Haze Plan describes the status of measures of the long-term strategy from the first implementation period to address the requirements found in 40 CFR 51.308(g)(1) and (2). Control measures to reduce emission within and outside the State are found in the 2021 Texas Regional Haze Plan, Chapter 7: Long-Term Strategy to Establish Reasonable Progress Goals, Section 7.4: Federal Programs that Reduce Stationary Source Emissions, Section 7.5: Federal Programs that Reduce Mobile Source Emissions, and Section 7.6: State Air Pollution Control Programs. Control measures in the State are included in Section 7.6: State Air Pollution Control Programs, which discusses both State stationary and mobile source emissions control measures; Section 7.6.2: Best Available Control Technology (BACT) Requirements, which discusses air permitting requirements for new and modified sources of air pollution; and finally Section 7.6.3: Additional Measures, which discusses other measures addressing air pollution from mobile sources, construction activities, and fires, and measures addressing energy efficiency. Emissions reductions are found in the 2021 Texas Regional Haze Plan, Chapter 6: Emissions Inventory, Section 6.8: NO_X and SO_2 Emissions Trends, table 6–4: Anthropogenic NO_X Emissions by Source Type, and table 6–5: Anthropogenic SO_2 Emissions by Source Type.

The EPA proposes to find that Texas has addressed the requirements of 40 CFR 51.308(g)(1) and (2) because the 2021 Texas Regional Haze Plan describes the measures included in the long-term strategy from the first implementation period, as well as the status of their implementation and the emission reductions achieved through such implementation.

Section 51.308(g)(3) requires that for each Class I area within the State, the State must assess the following visibility conditions and changes, with values for most impaired, least impaired and/or clearest days as applicable expressed in terms of five-year averages of these annual values. The 2021 Texas Regional Haze Plan includes summaries of visibility conditions in Chapter 4: Assessment of Baseline and Current

Conditions and Estimate of Natural Conditions in Class I Areas, Section 4.2: Baseline Visibility Conditions, Section 4.3: Natural Visibility Conditions. Changes in visibility conditions are displayed in Chapter 8: Reasonable Progress Goals, Section 8.4: Reasonable Progress Goal Status. The EPA therefore proposes to find that Texas has addressed the requirements of 40 CFR 51.308(g)(3).

Pursuant to § 51.308(g)(4), Texas evaluated emission trends for reasonable progress for the 2021 Texas Regional Haze Plan and presented those data in Chapter 6: Emissions Inventory, Section 6.7: Emissions Summaries, table 6–1: 2011 Statewide Pollutant Summary by Source Category, table 6–2: 2014 Statewide Pollutant Summary by Source Category, table 6–3: 2017 Statewide Pollutant Summary by Source Category, table 6–4: Anthropogenic NO_X Emissions by Source Type, table 6–5: Anthropogenic SO_2 Emissions by Source Type. The EPA is proposing to find that Texas has addressed the requirements of § 51.308(g)(4) by providing emissions information for NO_X, SO_2, PM_{10}, $PM_{2.5}$, VOCs, and NH_3 broken down by type of source.

Since the 2009 and 2014 Texas regional haze SIP revisions, reductions in anthropogenic emissions within and outside the State have occurred from the following: (1) ongoing rules and regulations for nonattainment areas in Texas (see the 2021 Texas Regional Haze Plan Chapter 7: Long-Term Strategy to Establish Reasonable Progress Goals, Section 7.6: State Air Pollution Control Programs); (2) closing several major coal-fired plants in Texas, which have permanently reduced emissions (see Chapter 7, Section 7.6.3.8: Potential Effects of Economically Driven Coal Burning Power Plant Closures); (3) continuing reductions in mobile emissions through the incentives like Texas Emissions Reduction Plan (TERP) (see Chapter 7, Section 7.6.3.1: Texas Emissions Reduction Plan); (4) ongoing energy efficiency state-wide, which has continued to increase (see Chapter 7, Section 7.6.3.3: Energy-Efficiency (EE) Programs and Renewable Energy (RE) Measures); and other items discussed in Chapter 7 of the 2021 Texas Regional Haze Plan. Texas uses the emissions trend data in the 2021 Texas Regional Haze Plan [245] to support the assessment that anthropogenic haze-causing pollutant emissions in Texas have decreased during the reporting period and that changes in emissions have not limited or impeded progress in reducing pollutant emissions and improving visibility. Texas's 2017 emission inventories for NO_X, SO_2, PM_{10}, $PM_{2.5}$, VOCs, and NH_3 were lower than their 2014 emission inventories for those same pollutants emissions.[246] The EPA is proposing to find that Texas has addressed the requirements of § 51.308(g)(5).

In sum, because Texas's 2021 Regional Haze Plan addresses the requirements of 40 CFR 51.308(g)(1) through (5) as required by 40 CFR 51.308(f)(5), the EPA is proposing to approve Texas's 2021 Texas Regional Haze Plan as meeting the requirements of 40 CFR 51.308(f)(5) for periodic progress reports.

J. Requirements for State and Federal Land Manager Coordination

Section 169A(d) of the Clean Air Act requires states to consult with FLMs before holding the public hearing on a proposed regional haze SIP, and to include a summary of the FLMs' conclusions and recommendations in the notice to the public. In addition, section 51.308(i)(2)'s FLM consultation provision requires a State to provide FLMs with an opportunity for consultation that is early enough in the state's policy analyses of its emission reduction obligation so that information and recommendations provided by the FLMs' can meaningfully inform the state's decisions on its long-term strategy. If the consultation has taken place at least 120 days before a public hearing or public comment period, the opportunity for consultation will be deemed early enough, Regardless, the opportunity for consultation must be provided at least sixty days before a public hearing or public comment period at the State level. Section 51.308(i)(2) also provides two substantive topics on which FLMs must be provided an opportunity to discuss with states: assessment of visibility impairment in any Class I area and recommendations on the development and implementation of strategies to address visibility impairment. Section 51.308(i)(3) requires states, in developing their implementation plans, to include a description of how they addressed FLMs' comments.

The TCEQ consulted with the FLMs about the impact of Texas's emissions on regional haze at the regional Class I areas through conference calls. The TCEQ gave a presentation in March 2020 and discussed impacts to Class I areas in the region. An additional meeting was held October 8, 2020, where NPS presented its evaluation of the Texas SIP. NPS requested Texas look at 15 additional sources that were not included in the TCEQ's four-factor analysis. NPS also requested the TCEQ consider impacts to three New Mexico Class I areas: Bandelier, Salt Creek, and Carlsbad Caverns. NPS also identified inconsistencies between the TCEQ's SIP and the CAA. Both the NPS and FS submitted comment letters during the TCEQ's public comment period.

Texas responded to the FLM comments and included the responses in appendix A of their 2021 Regional Haze Plan. Notices of the proposed SIP, availability and the public hearing were published on TCEQ's website and in the Texas Register, the Fort Worth Star Telegram, the Houston Chronicle, the Austin American-Statesman, and the El Paso Times. A virtual public hearing on the proposed SIP revision was held on December 8, 2020, and was available for participation via internet or phone. Written comments relevant to the proposal were accepted until the close of business January 8, 2021.

Additionally, Texas's 2021 Regional Haze Plan includes a commitment to revise and submit a regional haze SIP by July 31, 2028, and every ten years thereafter. The state's commitment includes submitting periodic progress reports in accordance with 40 CFR 51.308(f) and a commitment to evaluate progress towards the reasonable progress goal for each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State in accordance with § 51.308(g).

Regardless of the consultation described above, compliance with 40 CFR 51.308(i) is dependent on compliance with 40 CFR 51.308(f)(2)'s long-term strategy provisions and (f)(3)'s reasonable progress goals provisions. Therefore, because the EPA is proposing to disapprove Texas's long-term strategy under 51.308(f)(2) and the reasonable progress goals under 51.308(f)(3), the EPA is also proposing to disapprove the State's FLM consultation under 51.308(i). While Texas did take administrative steps to provide the FLMs the opportunity to review and provide feedback on the State's draft regional haze plan, the EPA cannot approve that consultation because it was based on a plan that does not meet the statutory and regulatory requirements of the CAA and the RHR, as described in this notice of proposed rulemaking. In addition, if the EPA finalizes our proposed partial approval and partial

[245] *See* 2021 Texas Regional Haze Plan, Section 6.8.

[246] Trends in anthropogenic NO_X and SO_2 emissions are presented in Figures 6–1 and 6–2 of the 2021 Texas Regional Haze Plan, respectively.

disapproval of the 2021 Texas Regional Haze Plan, the State (or the EPA in the case of a FIP) will be required to again complete the FLM consultation requirements under 40 CFR 51.308(i). Therefore, the EPA proposes to disapprove the FLM consultation component of the 2021 Texas Regional Haze Plan.

V. Proposed Action

For the reasons discussed in this notice, under CAA section 110(k)(3), the EPA is proposing approval of the portions of Texas's 2021 Regional Haze Plan relating to 40 CFR 51.308(f)(1): calculations of baseline, current, and natural visibility conditions, progress to date, and the uniform rate of progress; 40 CFR 51.308(f)(4): reasonably attributable visibility impairment; 40 CFR 51.308(f)(5): [247] progress report requirements; and 40 CFR 51.308(f)(6): monitoring strategy and other implementation plan requirements. The EPA is proposing disapproval of the remainder of Texas's 2021 Regional Haze Plan, which addresses 40 CFR 51.308(f)(2): long-term strategy; 40 CFR 51.308 (f)(3): reasonable progress goals; and 40 CFR 51.308(i): FLM consultation.

VI. Environmental Justice Considerations

Information on Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, February 16, 1994) and how EPA defines environmental justice (EJ) can be found in the section, below, titled ''VII. Statutory and Executive Order Reviews.'' For informational and transparency purposes only, the EPA is including additional analysis of environmental justice associated with this proposed action.

EPA conducted screening analyses using EJSCREEN, an environmental justice mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining various environmental and demographic indicators.[248] The EJSCREEN tool presents these indicators at a Census block group (CBG) level or a larger user-specified ''buffer'' area that covers multiple CBGs.[249] An individual CBG is a cluster of contiguous blocks within the same census tract and generally contains between 600 and 3,000 people. EJSCREEN is not a tool for performing in-depth risk analysis, but is instead a screening tool that provides an initial representation of indicators related to environmental justice and is subject to uncertainty in some underlying data (*e.g.,* some environmental indicators are based on monitoring data which are not uniformly available; others are based on self-reported data).[250] To help mitigate this uncertainty, we have summarized EJSCREEN data within larger ''buffer'' areas covering multiple block groups and representing the average resident within the buffer areas surrounding the sources. We present EJSCREEN environmental indicators to help screen for locations where residents may experience a higher overall pollution burden than would be expected for a block group with the same total population. These indicators of overall pollution burden include estimates of ambient particulate matter ($PM_{2.5}$), ozone, nitrogen dioxide, and diesel particulate matter concentration, a score for traffic proximity and volume, percentage of pre-1960 housing units (lead paint indicator), and scores for proximity to Superfund sites, risk management plan (RMP) sites, and hazardous waste facilities.[251] EJSCREEN also provides information on demographic indicators, including percent low-income, unemployment, communities of color, linguistic isolation, and education.

The EPA prepared EJSCREEN reports covering a buffer area of approximately 6-mile radius around each source identified in this proposed rulemaking. Table 24 presents a summary of results from the EPA's screening-level analysis for a few of the areas in Texas compared to the U.S. as a whole. The full, detailed EJSCREEN report for all areas is provided in the docket for this rulemaking.

TABLE 24—EJSCREEN ANALYSIS SUMMARY FOR SOURCES

[see detailed EJSCREEN report for all sources]

Variables	Values for buffer areas (radius) for each source and the U.S. (percentile within U.S. where indicated)				
	Limestone	Martin Lake	Oklaunion	San Miguel	U.S.
Pollution Burden Indicators:					
Particulate matter ($PM_{2.5}$), annual average	8.13 µg/m³ (49%ile)	8.8 µg/m³ (69%ile)	6.94 µg/m³ (17%ile)	8.38 µg/m³ (58%ile)	8.45 µg/m³ (—)
Ozone, annual average of the top ten 8-hour daily maximums	61 ppb (53%ile)	56.9 ppb (32%ile)	57.2 ppb (33%ile)	61.7 ppb (56%ile)	61.8 ppb (—)
Nitrogen dioxide, annual average	3.7 ppb (11%ile)	3.2 ppb (8%ile)	3.6 ppb (11%ile)	2.9 ppb (6%ile)	7.8 ppb (—)
Diesel particulate matter	0.0574 µg/m³ (11%ile)	0.0572 µg/m³ (11%ile)	0.0496 µg/m³ (8%ile)	0.0384 µg/m³ (4%ile)	0.191 µg/m³ (—)
Toxic releases to air score *	320 (39%ile)	9400 (92%ile)	32 (14%ile)	92 (23%ile)	4,600 (—)
Traffic proximity and volume score *	12,000 (5%ile)	9,900 (4%ile)	59,000 (13%ile)	28,000 (8%ile)	1,700,000 (—)
Lead paint (percentage pre-1960 housing)	0.061% (29%ile)	0.12% (38%ile)	0.51% (74%ile)	0.08% (32%ile)	0.3% (—)
Superfund proximity score *	0 (0%ile)	0.014 (56%ile)	0 (0%ile)	0 (0%ile)	0.39 (—)
RMP proximity score *	0.14 (39%ile)	0.18 (42%ile)	0.32 (53%ile)	0.084 (30%ile)	0.57 (—)

[247] 40 CFR 51.308(f)(5) requires that the second planning period SIP revision address the requirements listed in (g)(1) through (g)(5).

[248] The EJSCREEN tool is available at *https://www.epa.gov/ejscreen.*

[249] *See* U.S. Census Bureau Glossary available at *https://www.census.gov/programs-surveys/geography/about/glossary.html.*

[250] In addition, EJSCREEN relies on the five-year block group estimates from the U.S. Census American Community Survey. The advantage of using five-year over single-year estimates is increased statistical reliability of the data (*i.e.,* lower sampling error), particularly for small geographic areas and population groups. More information is available at *https://www.census.gov/content/dam/Census/library/publications/2020/acs/acs_general_handbook_2020.pdf.*

[251] *See* EJSCREEN Environmental Justice Mapping and Screening Tool: EJSCREEN Technical Documentation for additional information on the data and methods used to create the indicators and indexes in EJSCREEN, which is available at *https://www.epa.gov/ejscreen/technical-information-and-data-downloads.*

TABLE 24—EJSCREEN ANALYSIS SUMMARY FOR SOURCES—Continued
[see detailed EJSCREEN report for all sources]

Variables	Values for buffer areas (radius) for each source and the U.S. (percentile within U.S. where indicated)				
	Limestone	Martin Lake	Oklaunion	San Miguel	U.S.
Hazardous waste proximity score *	0.058 (15%ile)	0.055 (15%ile)	0 (0%ile)	0 (0%ile)	3.5 (—)
Underground storage tank proximity score *	0.022 (29%ile)	0.18 (36%ile)	0.11 (34%ile)	0.000039 (26%ile)	3.6 (—)
Wastewater discharge score *	52 (50%ile)	50 (49%ile)	0.35 (18%ile)	14 (38%ile)	700,000 (—)
Drinking water noncompliance, points	2.7 (87%ile)	9.9 (92%ile)	2.2 (87%ile)	0.86 (77%ile)	2.2 (—)
Demographic Indicators:					
People of color population	21% (37%ile)	33% (51%ile)	43% (60%ile)	44% (61%ile)	40% (—)
Low-income population	33% (60%ile)	28% (52%ile)	41% (72%ile)	15% (29%ile)	30% (—)
Unemployment rate	3% (45%ile)	4% (55%ile)	5% (62%ile)	9% (79%ile)	6% (—)
Linguistically isolated population	1% (59%ile)	0% (56%ile)	4% (71%ile)	0% (57%ile)	5% (—)
Population with less than high school education	11% (60%ile)	8% (50%ile)	30% (91%ile)	29% (91%ile)	11% (—)
Population under 5 years of age	4% (47%ile)	9% (80%ile)	5% (54%ile)	0% (13%ile)	5% (—)
Population over 64 years of age	27% (83%ile)	17% (53%ile)	17% (55%ile)	35% (92%ile)	18% (—)

* The traffic proximity and volume indicator is a score calculated by daily traffic count divided by distance in meters to the road. The Superfund proximity, RMP proximity, and hazardous waste proximity indicators are all scores calculated by site or facility counts divided by distance in kilometers. The underground storage tank proximity indicator is the weighted count within a 1,500-foot block group. The toxic releases to air indicator is the modeled toxicity-weighted concentration. The wastewater discharge indicator is the modeled toxicity-weighted concentrations divided by distance in meters.

Exposure to PM and SO_2 is associated with significant public health effects. Short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO_2.[252] Exposure to PM can affect both the lungs and heart and is associated with: premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing. People with heart or lung diseases or conditions, children, and older adults are the most likely to be affected by PM exposure.[253] This action, which proposes to partially approve and partially disapprove the Texas Regional Haze SIP submitted on July 20, 2021, will not directly result in a change to emissions or air quality if finalized. Further, there is no information in the record indicating that this proposed action, if finalized, would have disproportionately high or adverse human health or environmental effects on communities with environmental justice concerns.

[252] *See* Sulfer Dioxide Basics available at *https://www.epa.gov/SO2-pollution/sulfurdioxide-basics#effect.*

[253] *See* Health and Environmental Effects: Particulate Matter available at *https://www.epa.gov/pm-pollution/healthand-environmental-effects-particulate-matter-pm.*

VII. Statutory and Executive Order Reviews

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

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review, Executive Order 13563: Improving Regulation and Regulatory Review, and Executive Order 14094: Modernizing Regulatory Review

This action is not a significant regulatory action as defined in Executive Order 12866 (58 FR 51735, October 4, 1993), as amended by Executive Order 14094 (88 FR 21879, April 11, 2023), and was therefore not subject to a requirement for Executive Order 12866 review.

B. Paperwork Reduction Act (PRA)

This action does not impose an information collection burden under the PRA (44 U.S.C. 3501 *et seq.*) because it does not contain any information collection activities.

C. Regulatory Flexibility Act (RFA)

This action is certified to not have a significant economic impact on a substantial number of small entities under the RFA (5 U.S.C. 601 *et seq.*). This action will not impose any requirements on small entities beyond those imposed by State law.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. This action imposes no enforceable duty on any State, local, or Tribal governments or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999). It 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.

F. Executive Order 13175: Coordination With Indian Tribal Governments

In addition, this proposed rulemaking action, pertaining to Texas regional haze SIP submission for the second planning period, does not apply on any Indian reservation land or in any other area where the EPA or an Indian Tribe has demonstrated that a Tribe has jurisdiction. In those areas of Indian country, the rule does not have Tribal implications and will not impose substantial direct costs on Tribal governments or preempt Tribal law as specified by Executive Order 13175 (65 FR 67249, November 9, 2000).

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

EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern environmental health or safety risks that EPA has reason to believe may disproportionately affect children, per the definitions of ''covered regulatory action'' in section 2–202 of the Executive Order. Therefore, this action is not subject to Executive Order 13045 because it merely proposes to partially approve and partially disapprove a SIP revision as meeting federal requirements. Furthermore, the EPA's Policy on Children's Health does not apply to this action.

H. Executive Order 13211: Actions 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 (NTTAA)

Section 12(d) of the NTTAA directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. This action is not subject to the requirements of section 12(d) of the NTTAA (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA.

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

Executive Order 12898 (Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, Feb. 16, 1994) directs Federal agencies to identify and address ''disproportionately high and adverse human health or environmental effects'' of their actions on communities with environmental justice (EJ) concerns to the greatest extent practicable and permitted by law. The EPA defines EJ as ''the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.'' The EPA further defines the term fair treatment to mean that ''no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies.''

The State did not evaluate environmental justice considerations as part of its SIP submittals; the CAA and applicable implementing regulations neither prohibit nor require such an evaluation. The EPA performed an environmental justice analysis, as is described above in the section titled, ''Environmental Justice Considerations.'' The analysis was done for the purpose of providing additional context and information about this rulemaking to the public, not as a basis of the action. Due to the nature of the action being taken here, if finalized, this action is expected to have a neutral impact on the air quality of the affected area. Consideration of EJ is not required as part of this action, and there is no information in the record inconsistent with the stated goal of E.O. 12898 of achieving environmental justice for communities with EJ concerns.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Nitrogen dioxide, Ozone, Particulate matter, Sulfur oxides.

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

Dated: September 27, 2024.

Earthea Nance,

Regional Administrator, Region 6.

[FR Doc. 2024–23341 Filed 10–10–24; 8:45 am]

BILLING CODE 6560–50–P